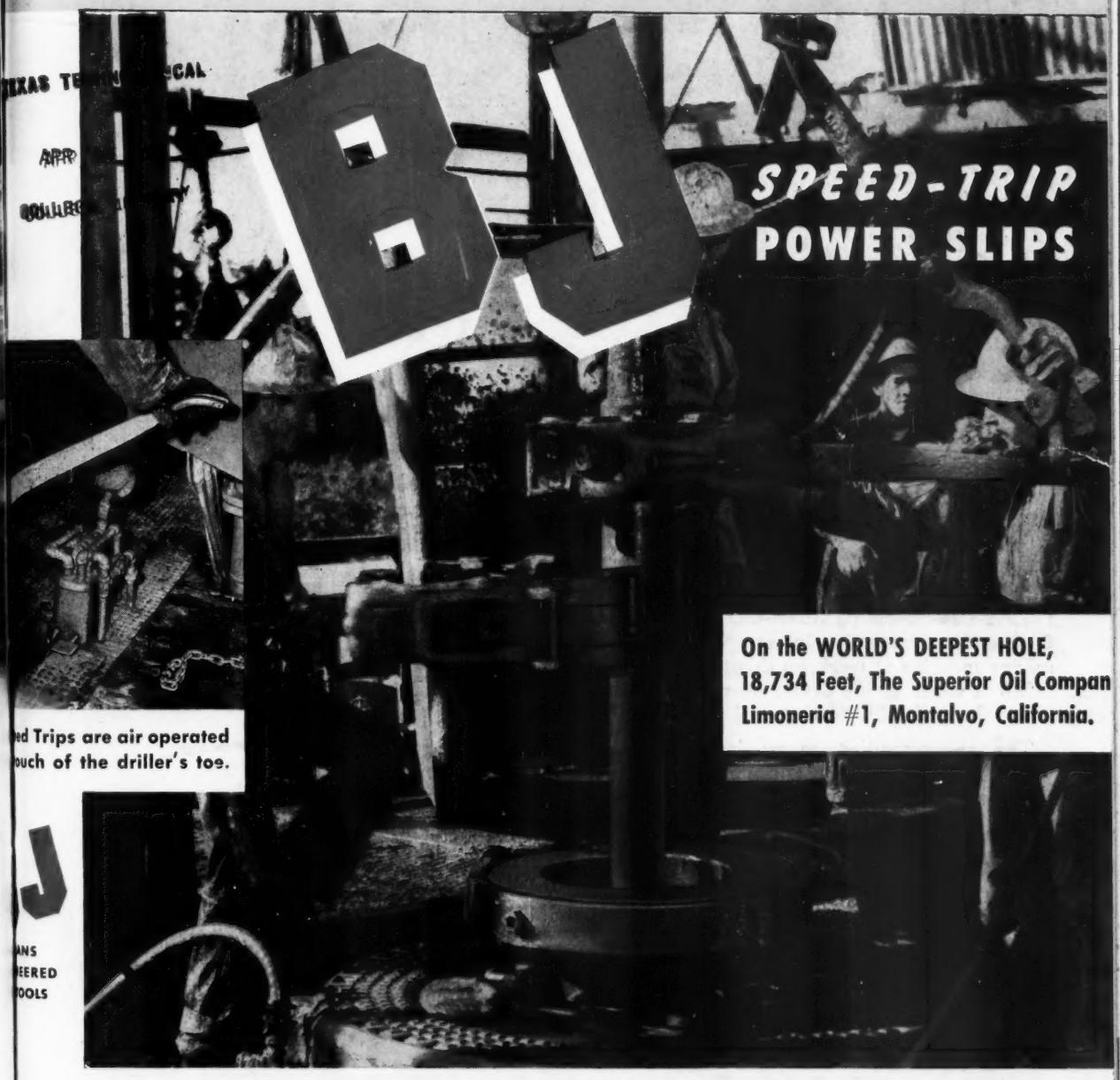
the OIL AND GAS JOURNAL



As a team BJ Speed Trip Power Slips, Tongs, Elevator and Links made possible ***faster, easier round trips*** *in approximately* **10½ hours** *on the World's Deepest Hole.*

Byron Jackson Co.

Since 1872

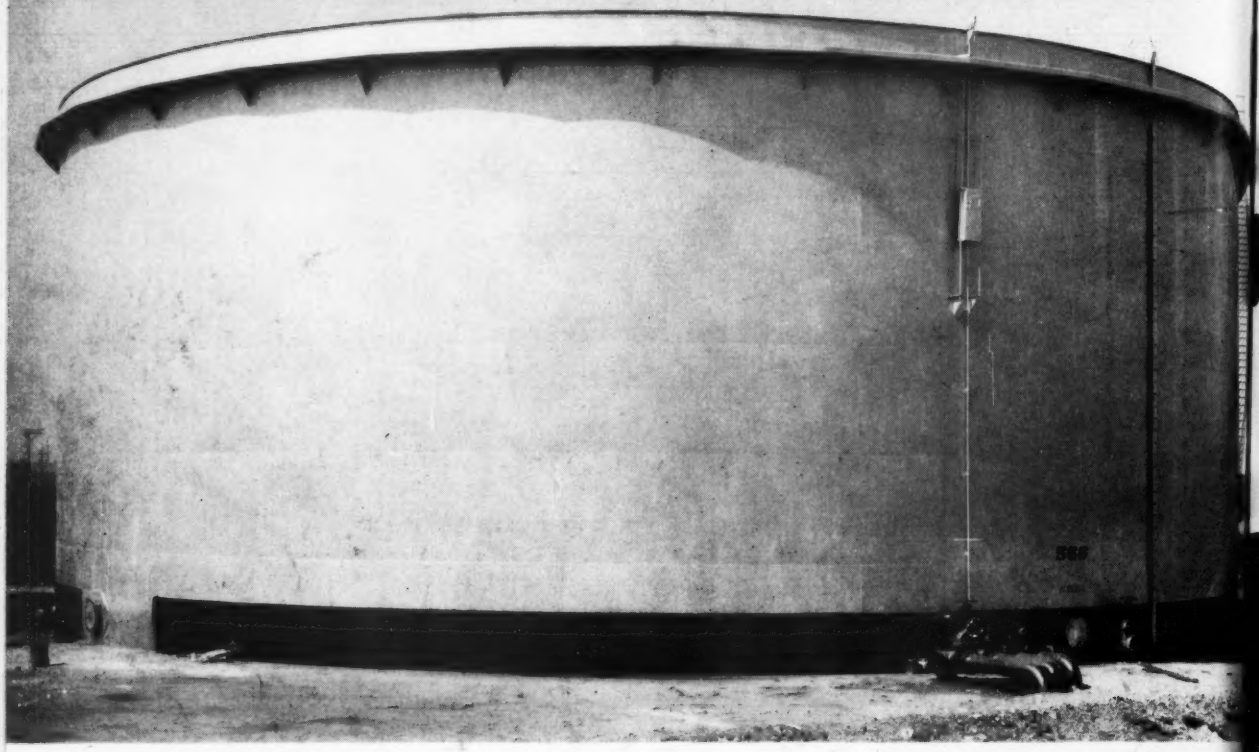
MAIN OFFICE AND PLANT: LOS ANGELES 54, CALIFORNIA

Mid-Continent Office and Plant, Houston 1, Texas • Export Office, New York 17, New York • Stocking Jobbers All Principal Oil Field

PRICE 50 CENTS TABLE OF CONTENTS PAGE 53 **APRIL 14, 1949**

HORTON
Double Deck
FLOATING ROOF

with the efficient HORTON seal

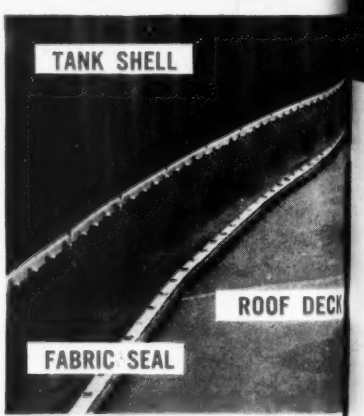


This Horton tank is located at the Sinclair Refining Company's East Chicago, Ind., refinery.

THE 96,000-bbl. tank shown above is equipped with a Horton Double-Deck Floating Roof—the roof that protects volatile liquids from costly evaporation losses and reduces the danger of fire to a minimum. Also at work on this tank is the Horton Seal, the most efficient vapor-saving device ever developed to close the space between the deck of a floating roof and the tank shell.

The two outstanding construction features of the Horton seal are—(1) the metal sealing ring with its vertical flexures, and (2) the new pantagraph hangers which hold the sealing ring gently but firmly against the tank shell. (The sealing ring is held against the tank shell closely enough to peel off wax that has accumulated on the inside of the shell during cold weather.) The hangers are inside of the seal, where they are protected from weather. They are designed with adequate tolerances to operate freely and will not stick or bind. Built ruggedly, they are long lived and have sufficient extra strength to operate efficiently even if their section is reduced by corrosion.

Ask our nearest office to give you complete details.



Close-up view of a Horton Double-D Floating Roof, showing the flexible terial that closes the space betwee top of the sealing ring and the With the hangers inside the seal, roof is free of obstructions, and painted and maintained.

CHICAGO BRIDGE & IRON COMPANY

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PENNSYLVANIA

Atlanta, 3.....2154 Healey Bldg.
Birmingham, 1.....1536 North 50th St.
Boston, 10.....1025-201 Devonshire St.
Chicago, 4.....2128 McCormick Bldg.
Cleveland, 15.....2204 Guildhall Bldg.
Detroit, 26.....1514 Lafayette Bldg.
Havana.....402 Abreu Bldg.
Houston, 2.....2119 National Standard Bldg.
Los Angeles, 14.....1523 General Petroleum Bldg.
New York, 6.....3347-165 Broadway Bldg.
Philadelphia, 3.....1615-1700 Walnut Street Bldg.
Salt Lake City, 1.....1525 First Security Bank Bldg.
San Francisco, 11.....1254-22 Battery Street Bldg.
Seattle, 1.....1325 Henry Bldg.
Tulsa, 3.....1606 Hunt Bldg.

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Motherwell Bridge & Engineering Company, Limited, Motherwell, Scotland
Chicago Bridge & Iron Company, Limited, Apartado 1348, Caracas, Venezuela

Tornado!

Driving, ripping, slashing power. One of Nature's most dreaded phenomena. Yet Bethlehem has harnessed much of this same power, calmed it, and put it to work in a great new drilling rig—the Bethlehem Tornado. Here is a mighty 3-engine rig for deep-hole drilling—13,500 feet; an outfit air-controlled from start to finish.

Despite its tremendous power and reserve, the Tornado is an easy rig to handle. With control at his fingertips, the driller is always in command. His job is made still easier by automatic self-adjusting clutches.

Full details are available now — today. Ask for the story of this new-era drilling rig.

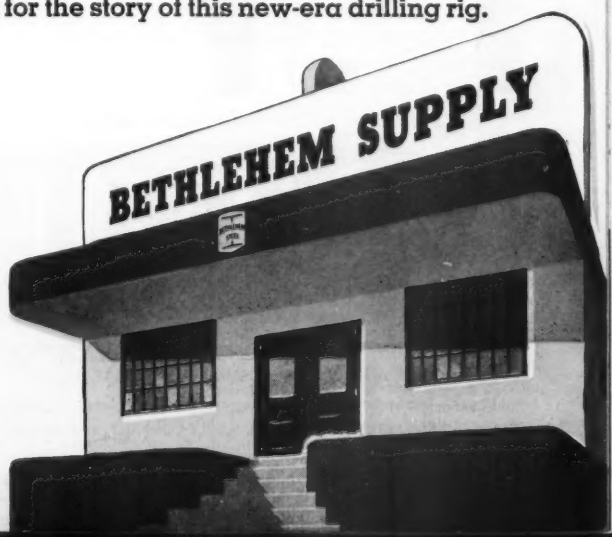
BETHLEHEM SUPPLY COMPANY

General Offices: 21 E. Second Street, Tulsa, Okla.

Subsidiary of Bethlehem Steel Corporation

On the Pacific Coast Bethlehem Oil-Field Equipment is sold by Bethlehem Supply Company of California

BETHLEHEM STEEL



D+B Challenger Pumps

FOR LOW-COST HIGH-VOLUME PRODUCTION

D+B Challenger Pumps are unsurpassed for economical and efficient well production under a wide range of conditions. The barrel tubes are made of high grade seamless steel tubing, precision honed to a mirror-like finish. The grooved sectional plungers are made of hardened cast iron for maximum strength and durability. High quality materials, improved design and precision workmanship make D+B Challenger Pumps outstanding for low-cost, high-volume production under severe operating conditions.

STATIONARY BARREL WITH 3-CUP TOP HOLD-DOWN

This pump is particularly effective in sandy formations. Top hold-down suspension prevents sand from packing between the pump and tubing. The high quality materials and armored fittings provide longer life against abrasive action of sand.

STATIONARY BARREL WITH 3-CUP BOTTOM HOLD-DOWN

Recommended for moderate to deep wells. Highly efficient in corrosive abrasive, gaseous or slant holes. The accurately honed barrel tube combined with hardened sectional plunger and armored fittings make the pump resistant to corrosive and abrasive elements.

TRAVELING BARREL WITH 3-CUP BOTTOM HOLD-DOWN

The D+B Traveling Barrel Challenger Pump is of particular value in sandy wells where operation is intermittent. The reciprocating action of the traveling barrel tube agitates and lifts any sand that has accumulated around the pump tube during shutdown periods. It will also operate effectively under gaseous conditions and heavy fluid loads.

All Challenger Pumps equipped with hardened iron grooved sectional end plungers. Two to plunger sections are assembled on the precision ground plunger tube. They are made of fine grain alloy, centrifugally cast iron and heat treated for maximum H-C-I plunger sections economical to replace long, severe service.

D+B Barrel Tubes are made of high quality seamless steel tubing honed to a smooth precision surface. This assures efficient plunger operation. The dimensions of tubes are carefully controlled to assure complete interchangeability.

The 3-cup Hold down consists of a body, 3 seating cup rings and an adapter or nut. Under column fluid pressure the cups expand against the precision surface of the seating shoe or nipple to assure a perfect seal. The ends of the cups are protected against turning or tearing by overhanging metal lips on the seating cup rings.

All Challenger Pumps may be equipped with Simplex top or bottom lock or A.P.I. Bottom Lock Hold-downs as optional equipment. Shoe assemblies for use with Simplex locks are interchangeable between top and bottom hold-downs by merely changing locks in the shoe.

Superloy Balls and Seats are standard in all Challenger Pump assemblies. They are made of a high grade stainless steel and are carefully tested for efficient valve action. Simplex Balls and Seats are made of same high quality materials are available as optional equipment.

For additional information on D+B Challenger Pumps ask for Bulletin 631-A.

CONTINENTAL

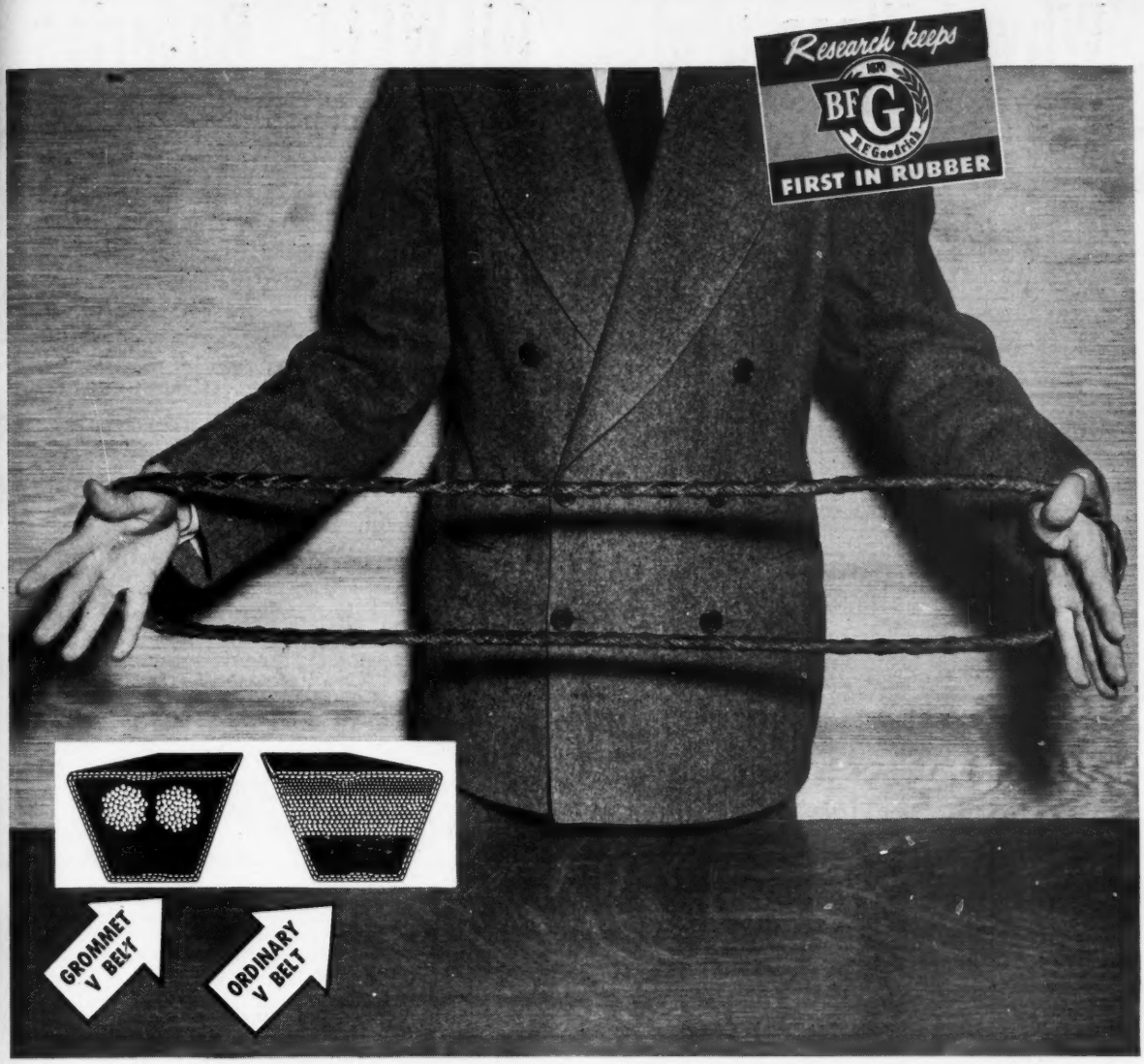
SERVING THE OIL AND GAS INDUSTRIES

D+B DIVISION EMSCO DERRICK & EQUIPMENT COMPANY
LOS ANGELES, CALIFORNIA DALLAS, TEXAS

Mid-Continent Distributor: THE CONTINENTAL SUPPLY COMPANY, Dallas, Texas
Export Distributor: THE CONTINENTAL SUPPLY COMPANY, INC., New York, N. Y.

D+B

DEEP WELL PUM
AND SUCKER R



A grommet is not a cable

New B. F. Goodrich grommet V belts cut costs 20 to 50%

A GROMMET is made by winding heavy cord upon itself to form an *endless* loop. Don't confuse it with an ordinary cable, which is merely a twisted cord, the ends of which must overlap to make a loop. The B. F. Goodrich grommet V belt combines all of the load-carrying cord into twin endless grommets, saves belt costs by working better, lasting longer.

Grommet belts are more flexible—They have no splice, no stiff section where cords overlap (85% of failures of ordinary belts occur in overlapped sections). BFG belts have twin grommets, no fabric or plies in the middle of the belt that stiffen it and generate heat. They have more *elasticity*, less permanent stretch than any other belt.

Stand shocks better—Actual running tests in field and laboratory show that BFG grommet V belts have a higher safety factor, much greater ability to withstand shock load than do ordinary V belts—actually lasted 20 to 50% longer!

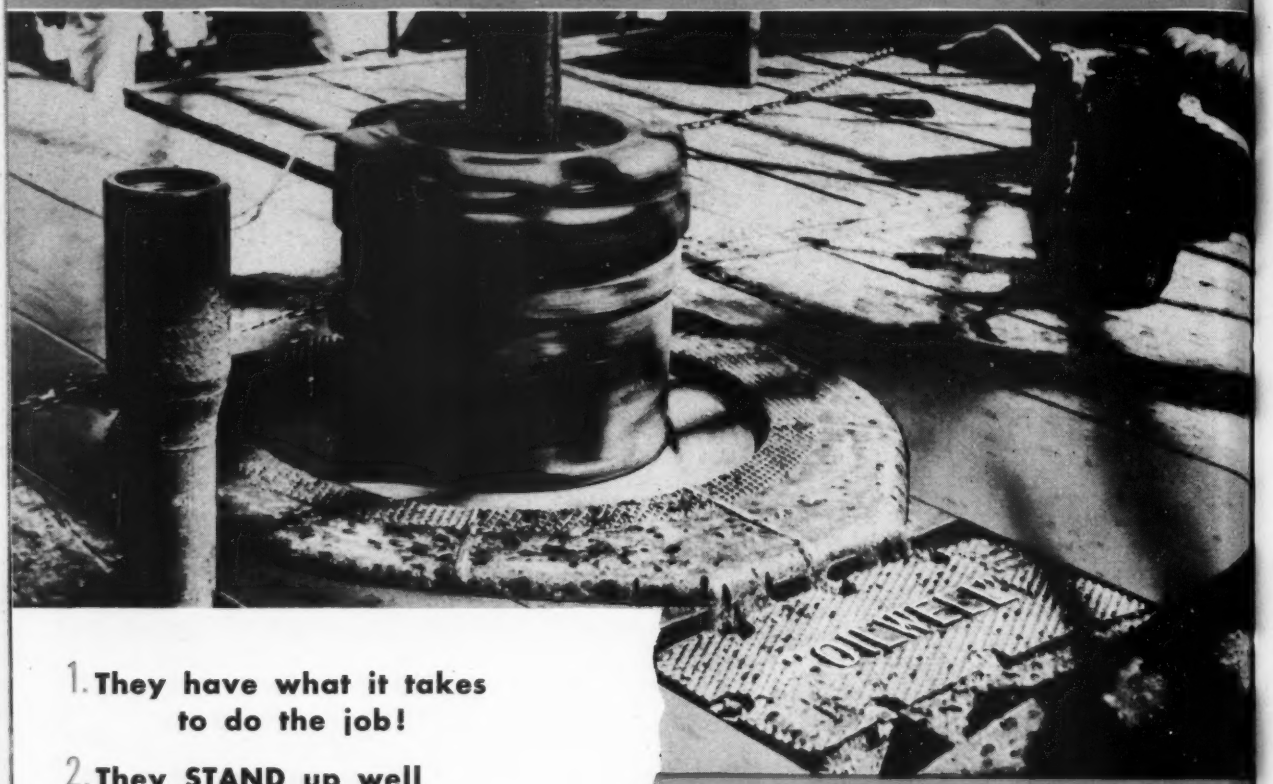
No "lost" cords—In an ordinary V belt much of the cord strength is lost—wasted in the center of the belt where the cords don't pull their share of the load. In a grommet belt *all* the cords work *all the time*. There are no center cords.

Only BFG has the grommet belt—Twin grommet construction is an exclusive, patented B. F. Goodrich development (U. S. Patent No. 2,233,294). To make sure you get genuine grommet V belts, (for the present made only in the larger—the D and E sizes), see your local distributor. (He also has a full line of light-duty belts for industrial needs.) *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

Grommet V Belts BY

B.F.Goodrich

Why drillers prefer "OILWELL" Rotaries



1. They have what it takes to do the job!

2. They STAND up well under tough conditions!

3. Their cost is LOW— measured by service!

THESE are the "Plus Values" of "Oilwell" engineering experience and manufacturing facilities which are embodied in "Oilwell" Rotaries—enabling them to give outstanding performance. Their quiet operation is an outward indication of excellent balance, freedom from vibration, foolproof construction and low-friction design—each highly essential in the free transmission of power from prime-mover to drilling bit.

SERVICE RATINGS

"OILWELL" ROTARIES	17½-C	17½-D	20½"	21-A	27½-B
Rated Supportable Dead-Load Capacity . . . tons	200	200	250	300	350
Maximum Recommended Drill-Depth . . . . feet	9,000	9,000	13,000	17,000	17,000
Maximum Recommended Table Speed . . . r.p.m.	500	500	500	1000	500
Gear Ratio	3.28:1	3.82:1	3.28:1	2.61:1	3.84:1

Let your nearest "Oilwell" representative point out the many improved construction features of "Oilwell" Rotaries. They are your assurance of easy maintenance and long, trouble-free performance.

"OILWELL" 27½-B OILBATH ROTARY . . . is designed for drilling depths to 17,000 feet and for drilling speeds to 500 r.p.m., with a full 27½ inch cylindrical table opening to permit the running of large casing sizes.

"OILWELL" 21-A SUPER-SPEED ROTARY . . . will perform satisfactorily at any desired speed to 1,000 r.p.m., and is conservatively rated for drilling depth to 17,000 feet. Cylindrical table opening is full 21 inches in diameter.

"OILWELL" 20½-INCH OILBATH ROTARY . . . has a cylindrical table opening of a full 20½ inches in diameter. This rotary is designed for drilling depths to 13,000 feet and for maximum drilling speeds to 500 r.p.m.

"OILWELL" 17½-C and 17½-D OILBATH ROTARIES . . . are designed for shallow to medium drilling depths of 9,000 feet and for drilling speeds to 500 r.p.m. Both the 17½-C and 17½-D have full cylindrical table opening of 17½ inches.

OIL WELL SUPPLY COMPANY

Branches Serving All Oil Fields

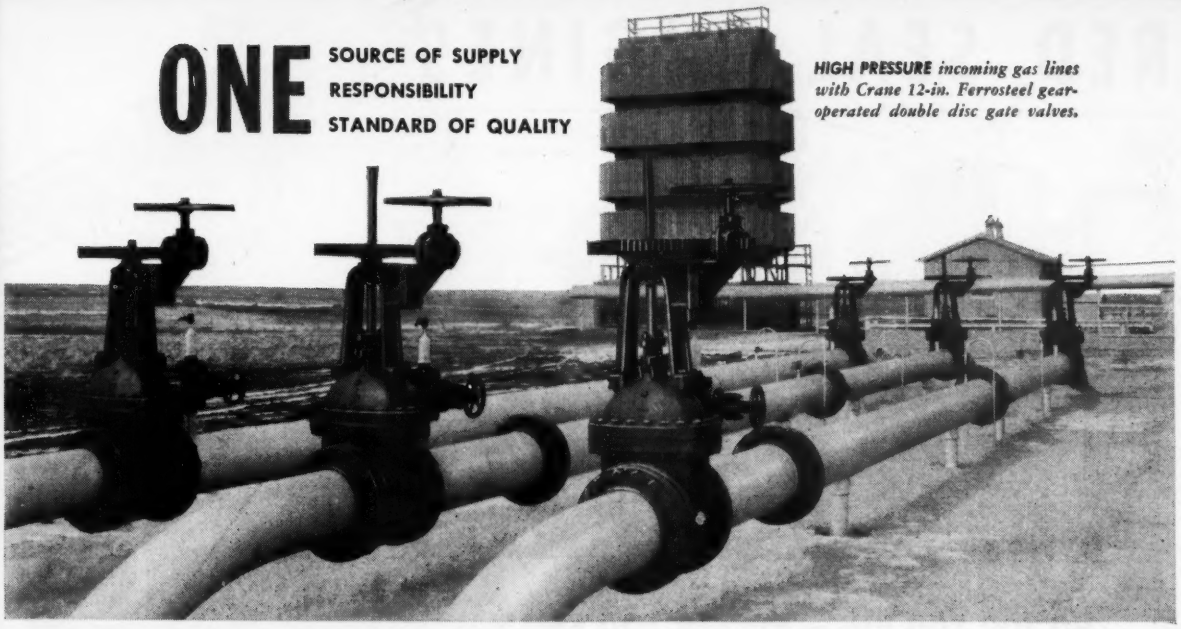
Executive Offices—DALLAS, TEXAS
Export Division Office—
30 ROCKEFELLER PLAZA
NEW YORK 20, N. Y.

Division Offices — CASPER, WYOMING
COLUMBUS, OHIO . . . DALLAS, TEXAS
HOUSTON, TEXAS . . . TULSA, OKLAHOMA
LOS ANGELES, CALIFORNIA

USS "OILWELL"

UNITED STATES STEEL

ONE SOURCE OF SUPPLY
RESPONSIBILITY
STANDARD OF QUALITY



HIGH PRESSURE *incoming gas lines with Crane 12-in. Ferrosteel gear-operated double disc gate valves.*

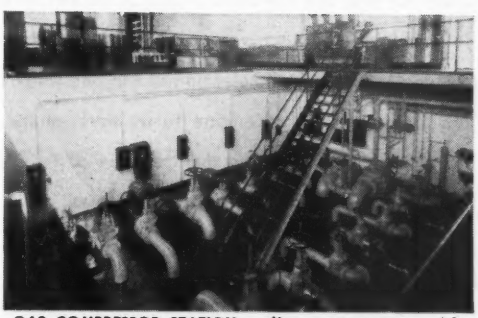
One order to CRANE . . .

Covers all petroleum piping needs

That's why oil men the world over turn to Crane. They know that the production and transmission of oil calls for good piping—and plenty of it. They also know that Crane offers them, in one catalog, the world's most complete selection of valves, fittings, pipe and accessories . . . in brass, iron, steel and alloys. That one order to Crane—through Branches and Wholesalers—gives a fast start to any petroleum piping job.

There are clear-cut advantages in standardizing on Crane. It's a **Single Source of Supply** complete enough to simplify every piping procedure, from design to erection to maintenance. **One Responsibility** for materials helps you to get better installations, avoids needless delays. And **High Quality** in every item in the Crane line assures most efficient performance from every part of piping systems.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas



GAS COMPRESSOR STATION *cooling water pumps with Crane wedge disc and double disc gate valves. Also flanged and welding fittings from the complete Crane line.*

BOILER CONTROL MANIFOLD *on record depth well, using Crane brass, iron and steel piping equipment.*

EVERYTHING FROM . . .

VALVES
FITTINGS
PIPE

CRANE

PLUMBING
AND
HEATING

FOR EVERY PIPING SYSTEM

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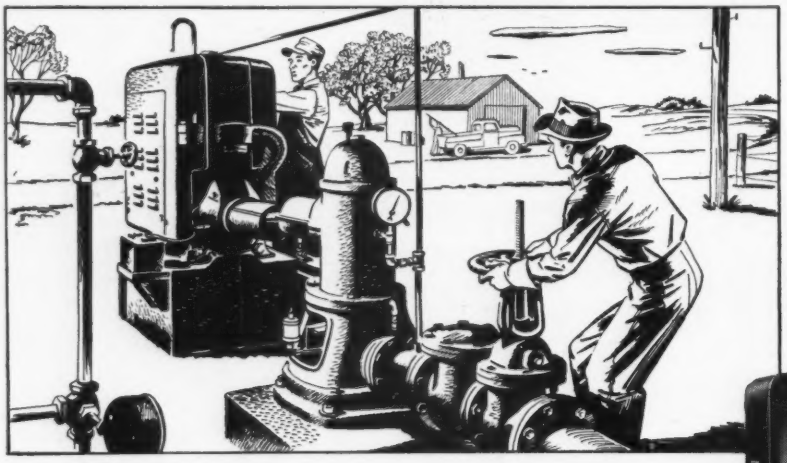
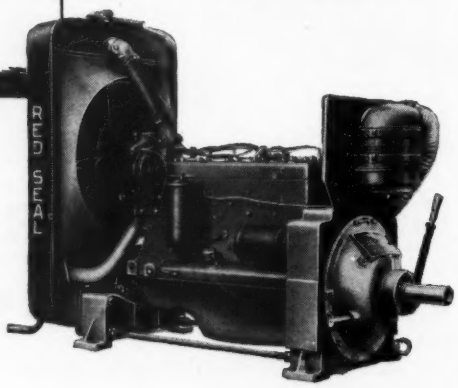
RED SEAL ENGINES

CONTINENTAL MOTORS · Powering the Nation · AMERICA'S STANDARD



BUILT FOR THE JOB!



NO JOB TOO BIG — NO JOB TOO SMALL

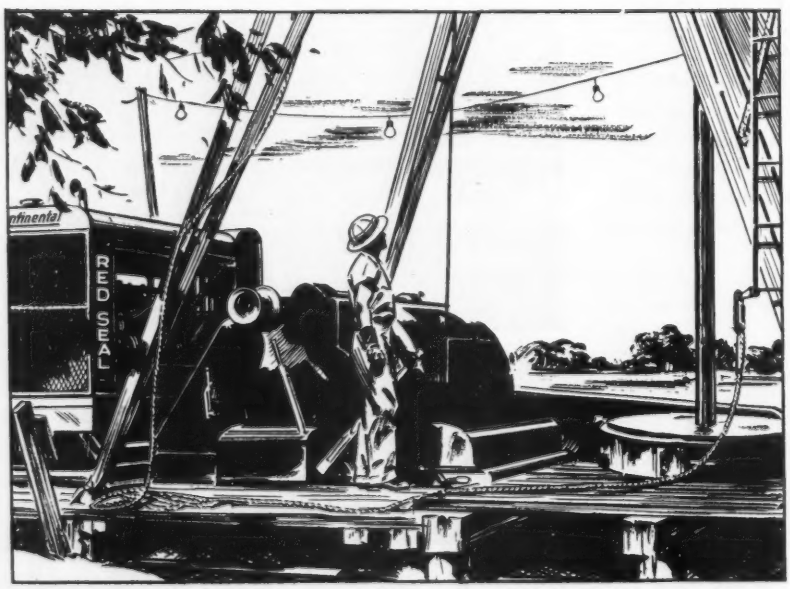
More and more oil men are cutting costs — boosting profits — by standardizing on Red Seal power. Trouble-free operation, interchangeability of parts, and ease of servicing help to account for this, but the basic reason is the ***completeness*** of the Red Seal line. At any given power level, there is a choice of Red Seal models, to permit selection of the one which exactly fits the job. This matching of engine to its work means longer engine life, lowest operating and maintenance costs. Get the facts on the Red Seal engines ***built for your jobs.***

M-330 OPEN POWER UNIT

This medium-range power plant, delivering upwards of 55 h.p. for continuous duty natural gas operation, is available as an open or closed power unit, and as a bare engine. The Red Seal M-330 is one of 9 specialized engines designed and built for every type of oil field application. Bulletin PM47330 is yours for the asking.

Continental Motors Corporation

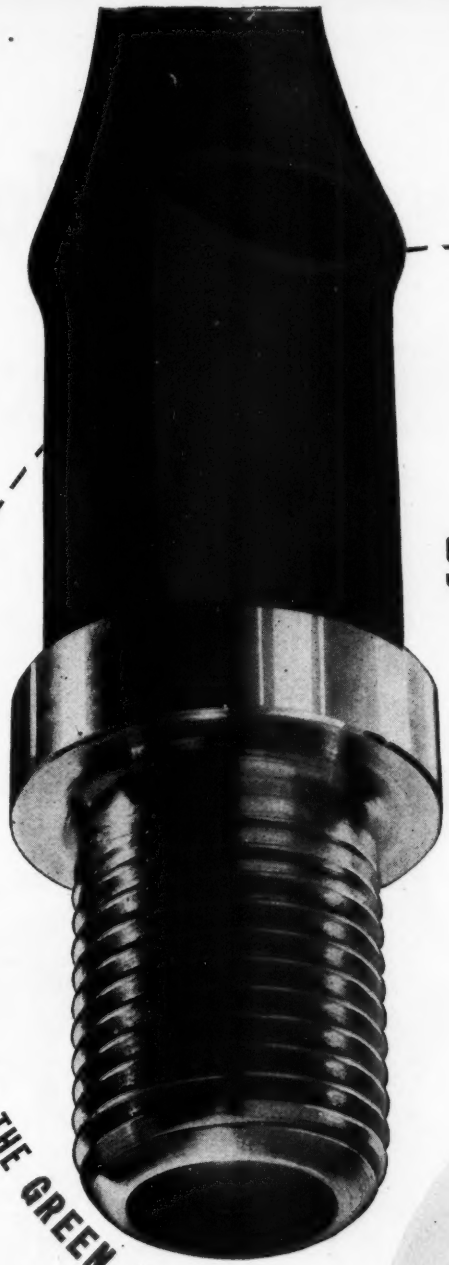
205 MARKET ST., MUSKEGON, MICHIGAN
P.O. BOX 2309, DALLAS, TEXAS

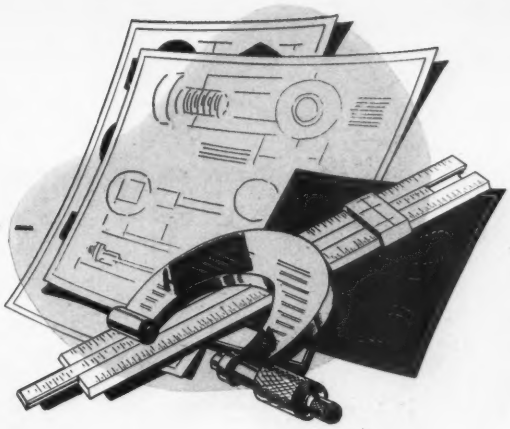


RED SEAL SERVICE

near as the nearest oil field.

Super-service depots on Dallas and Los Angeles, plus a nation-wide network of distributors and dealers, provide a fast, efficient parts service—another reason why operators are standardizing on Red Seal power.





LOOK FOR THE GREEN RODS

Specialized Experience

Because this organization concentrates its attention on the design, production, application of sucker rods, it is only natural for the industry to look to us for specialized knowledge of our products and their application. This specialization created the first all metal sucker rod. It has brought about a long string of other and equally important "firsts"... advancements and improvements that have helped make sucker rod pumping more efficient—more productive—and more economical.

● *Write for booklet on the "Care and Handling of Sucker Rods" as well as your copy of a folder describing the new Snap-Tite Wrench.*

JONES
SUCKER RODS

★ **THE S. M. JONES COMPANY**
(Subsidiary of Buffalo Bolt Company)
General Office and Factory: TOLEDO, OHIO
Sales Office: Kennedy Building, Tulsa, Okla.
Export Sales Office: Buffalo International Corp.
50 Church Street, N. Y. C.

How
USS
AMERICAN
TIGER BRAND
WIRE ROPE
UNITED STATES STEEL

the proper wire rope

-will save you money

● Every user wants to get the best possible service out of his wire lines.

Maximum service can be obtained only when these wire lines are properly reeved for loads to be handled and are of the correct size, construction and most suitable grade of steel.

To assure the use of the proper wire lines on your equipment, follow the recommendations given in our catalog, "American Tiger Brand Wire Lines for Oil, Gas and Water Wells."

To assure obtaining the very best in quality and workmanship, order American Tiger Brand Wire Lines—produced by the world's leading manufacturer of wire rope.

Follow these two simple steps and save yourself money as well as trouble and shut down time. Start now by mailing this coupon.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

American Steel & Wire Company
Rockefeller Building, Dept. P-4-14
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Gentlemen:
Send me your catalog, "U·S·S American Tiger Brand Wire Lines."
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SEND FOR FREE CATALOG

AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

Now you can have BIG DIESEL *design advantages...* in a compact package

COMPARING a big, expensive slow speed diesel with a relatively small low priced diesel may sound like a comparison between a highway bus and a taxicab. But Murphy Diesel—and only Murphy—has succeeded in building into its line of compact engines many of the most important design features that are responsible for the big diesel's reputation for dependability, long life and operating economy.

Foremost among these features is the "true" diesel operating principle—solid fuel injected directly into a plain, open combustion chamber—which makes it possible to get the most power out of every drop of fuel with minimum wear and tear on the engine. "True" diesel operation in the Murphy Diesel is made possible by Murphy's Unit Fuel Injection System which eliminates all high pressure fuel lines and permits the precise control of fuel injection necessary for truly efficient operation.

Get full information, now, and plan to put Murphy's advantages to work for you.

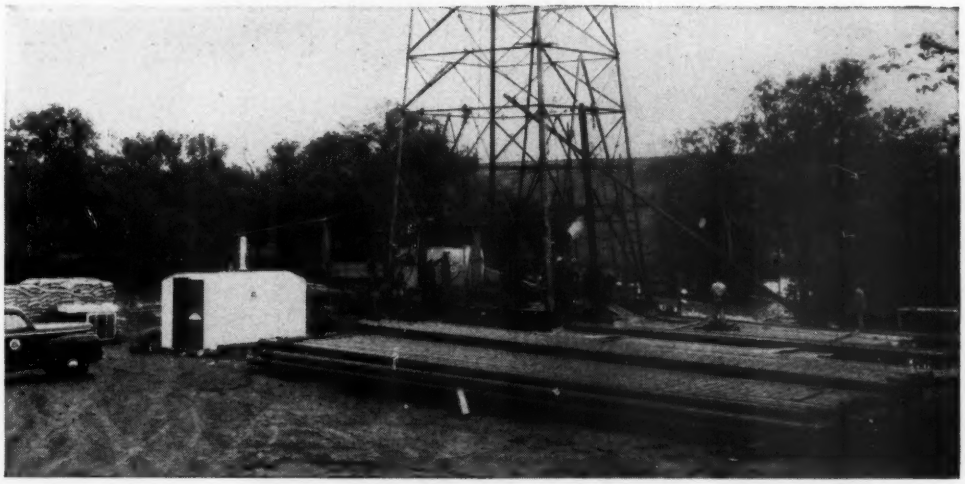
MURPHY DIESEL CO.

5305 W. Burnham St., Milwaukee 14, Wisconsin
Engines and Power Units 90 to 190 H.P.
Generator Sets 60 to 116 K.W.
Factory Branch — Sales, Parts & Service
113-17 SO. ELWOOD ST., TULSA, OKLA.

Critical Design Features Common to a Typical Big Heavy Duty Slow Speed Diesel and the MURPHY DIESEL

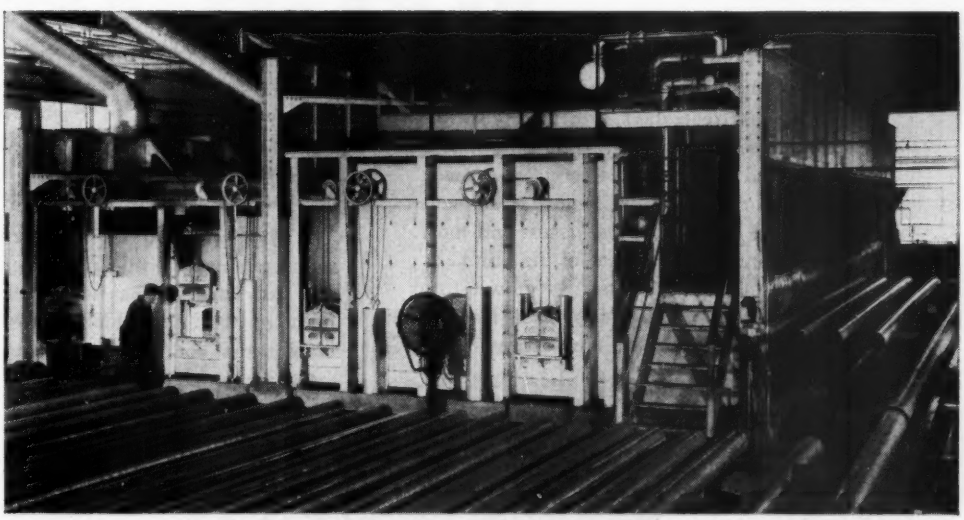
FEATURE	BIG DIESEL	MURPHY DIESEL
Does it have a plain open combustion chamber?	YES	YES
Does it have direct injection of solid fuel?	YES	YES
Are the pistons cooled?	YES	YES
Are cylinder liners removable and replaceable?	YES	YES
Does it have through tie bolts from head to bearing caps?	YES	YES
Are camshafts driven from the flywheel end of the crankshaft?	YES	YES
Does it have a hydraulic servo-type governor?	YES	YES

DEPENDABILITY THROUGH



IN THE FIELD, OKLAHOMA: running a combination string of SMITHway Casing--3350 feet of 7-inch S-40, and 2150 feet of 7-inch S-80.

RESEARCH AND ENGINEERING



IN THE A. O. SMITH PIPE MILL: a special furnace used for normalizing SMITHway Casing.

A.O. SMITH 75th ANNIVERSARY 1874 1949

SMITH*way* CASING · LINE PIPE

A. O. SMITH CORPORATION

New York 17 • Pittsburgh 19 • Atlanta 3 • Chicago 4 • Tulsa 3 • Dallas 1
Houston 2 • Seattle 1 • Los Angeles 14 • International Division: Milwaukee 1

THE YARDSTICKS OF OIL FIELD SERVICE

Research

Research is, in a sense, an extra return on your investment.

It directs part of the money you pay for services and products to the development of better services and products.

From its earliest days, Halliburton has considered research among its most important obligations and most valuable services. A small group of technicians using crude equipment has developed into one of the largest and most modern research departments of its kind. A modest schedule of activities has grown into one of the largest privately supported research programs in the field of oil production.

Howco research embraces chemistry and metallurgy, test and analysis, experiment and development. It includes studies of materials and processes under conditions which simulate those of a 20,000 ft. well.

Out of Howco research have come discoveries and developments of basic importance to present-day drilling. From it may be expected discoveries and developments that will assist in meeting tomorrow's problems and conditions.

A good question to ask when evaluating a source of supply is this: How deep is its interest and how far-reaching its contributions to the industry it serves? Halliburton interest and Halliburton contributions to drilling progress are a matter of record.

Halliburton

OIL WELL CEMENTING COMPANY

THERE IS NO SUBSTITUTE FOR EXPERIENCE IN OIL WELL CEMENTING

Prevent Water Hammer

with the "CUSHIONED CLOSING" of

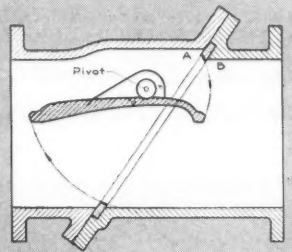
CHAPMAN

TILTING DISC CHECK VALVES

Chapman Tilting Disc Check Valves *work with . . . not against . . . the stream.* As a result, destructive pipe line stresses are practically eliminated. Head losses, as compared with conventional type check valves, are reduced 65% to 80%.

This balanced disc rides smoothly on the flow. It lifts away easily when opening . . . closes quickly and quietly. There is no rubbing on the seat . . . no slamming. Hinge pins, seats and bearings wear far longer.

These are facts. Write today for engineering data and reports of tests. Valves available in either iron or steel.

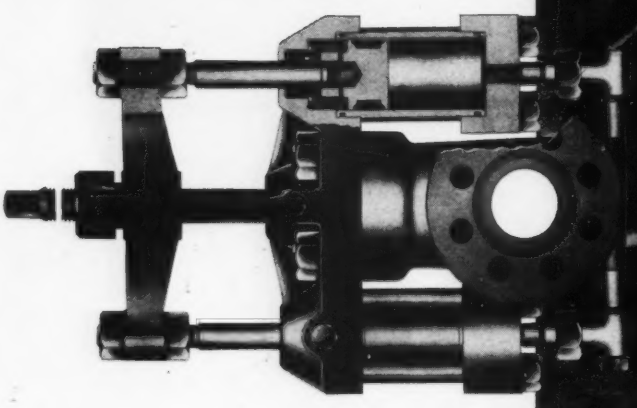


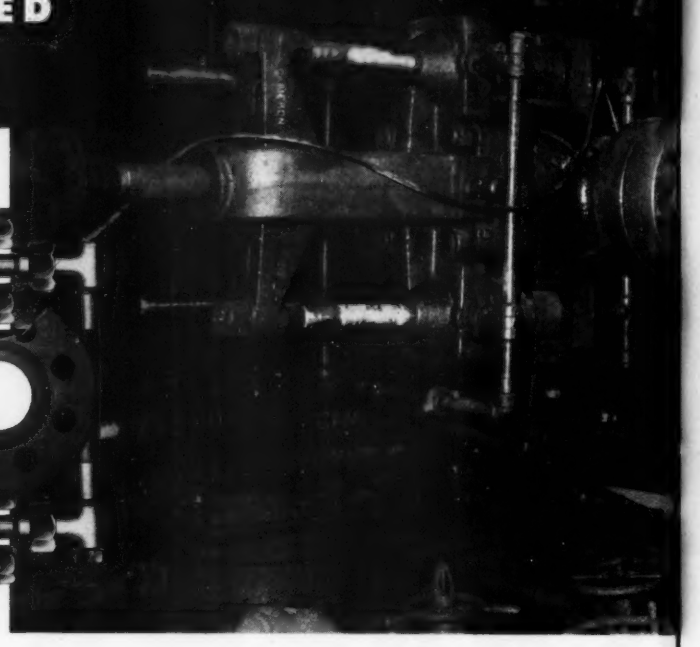
Cross-section of the Chapman Tilting Disc Check Valve illustrating the way that the balanced disc is supported on the pivot, with arrows showing the travel of the disc. A feature of the design is that the disc seat lifts away from the body seat when opening, and drops into contact when closing, with no sliding or wearing of the seats.

The Chapman Valve Manufacturing Company
INDIAN ORCHARD, MASSACHUSETTS

Cameron

"HCR" (HIGH CLOSING RATIO) PRESSURE OPERATED GATE VALVE





Above—Cameron Type "HCR" Pressure-Operated Gate Valve, showing one pressure operating cylinder in cross-section.

holds the flow line against destructive pressures

The Cameron Type "HCR" (High Closing Ratio) Pressure-Operated Gate Valve employs the same proven pressure operating mechanism as the Cameron Type "QRC" Blowout Preventer. Pressure cylinders, parallel to the gate bore on opposite sides of the body, and with piston rods attached to a yoke member which, in turn, is attached to the valve gate screw, open and close the gate as operating pressure is applied to the cylinders. The Type "HCR" Valve provides the same high ratio of closing pressure to well pressure as is provided by the Type "QRC" Blowout Preventer, i.e., 1000 lbs. pressure will close the Type "HCR" Valve against approximately 8000 lbs. well pressure. The ratio of opening pressure to well pressure is 4 to 1, so that the valve may be easily opened under high well pressure should it become necessary to relieve pressure thru a flow-line.

Cameron Type "HCR" Valves are available only in 4" and 6" sizes, API Series 1500-10,000 Lbs. Test Pressure. They are especially recommended for flow-line service; however, the 6" size may also be used as a drilling gate above 7" o.d. casing.

Complete details will gladly be sent to interested operators on request.

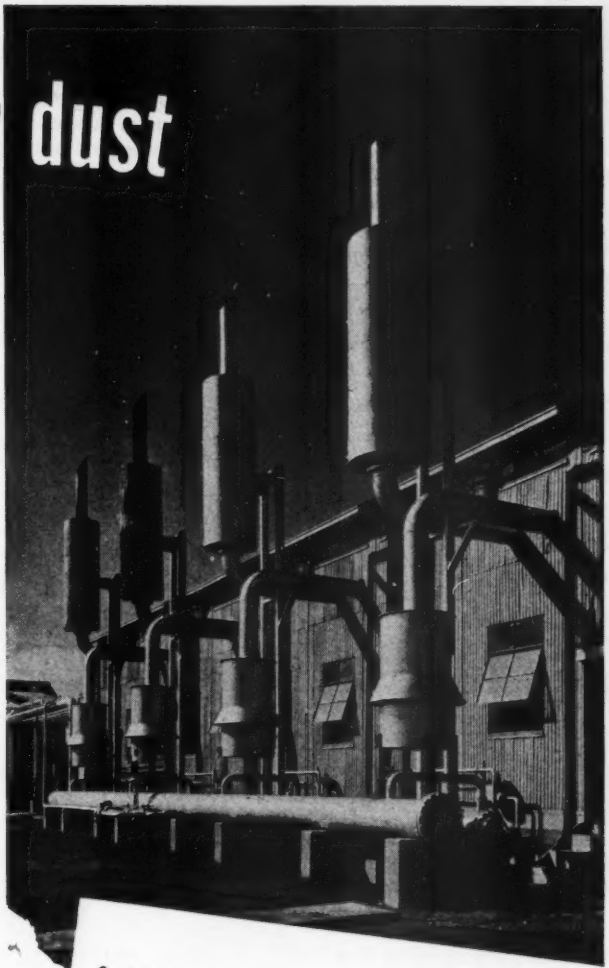
Cameron
IRON WORKS, INC.
P. O. BOX 1212 HOUSTON, TEXAS

Export:
74 Trinity Place, New York, N. Y.

Sudden death for dust

and savings for you...

when Cycoil Oil Bath Cleaners stand guard over engines and compressors



THERE'S plenty of dust but no dust problem at this Texas refinery. Every engine breathes air that is filtered free of dust and dirt by Cycoil* Oil Bath Air Cleaners.

Cycoil is a permanent "death house" for dust. Over 90% of the total fine dust content of the air is trapped in a Cycoil even before reaching the filter cell. Positive oil circulation for continued self-cleaning action, plus the additional filtration to be had in the filter pads, assures approximately 100% clean air.

You can't escape dust but you can stop it effectively and permanently at the intake with Cycoils—and they will return their cost quickly with the elimination of costly repairs and shutdowns due to dust damage. Write for copy of Bulletin 130-D.

AMERICAN AIR FILTER COMPANY, INC.
444 CENTRAL AVENUE • LOUISVILLE 8, KY.
In Canada: Darling Bros. Ltd., Montreal, P. Q.

**Trade-mark registered U. S. Patent Office*

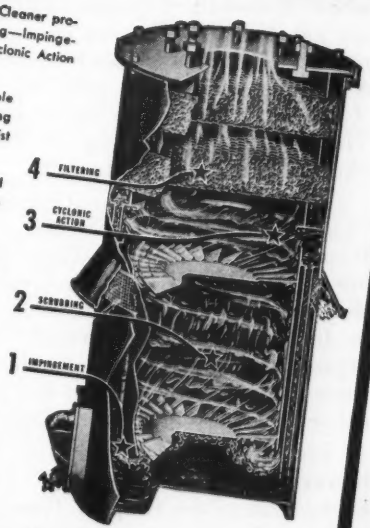
Cycoil Oil Bath Air Cleaner provides 4 way cleaning—Impingement, Scrubbing, Cyclonic Action and Filtering.

Filtration through Double Cells completes cleaning action eliminating oil mist from air.

Cyclonic action induced by vanes throws oil containing dust outward.

Scrubbing action, thoroughly mixes air and oil, entraining all dust particles.

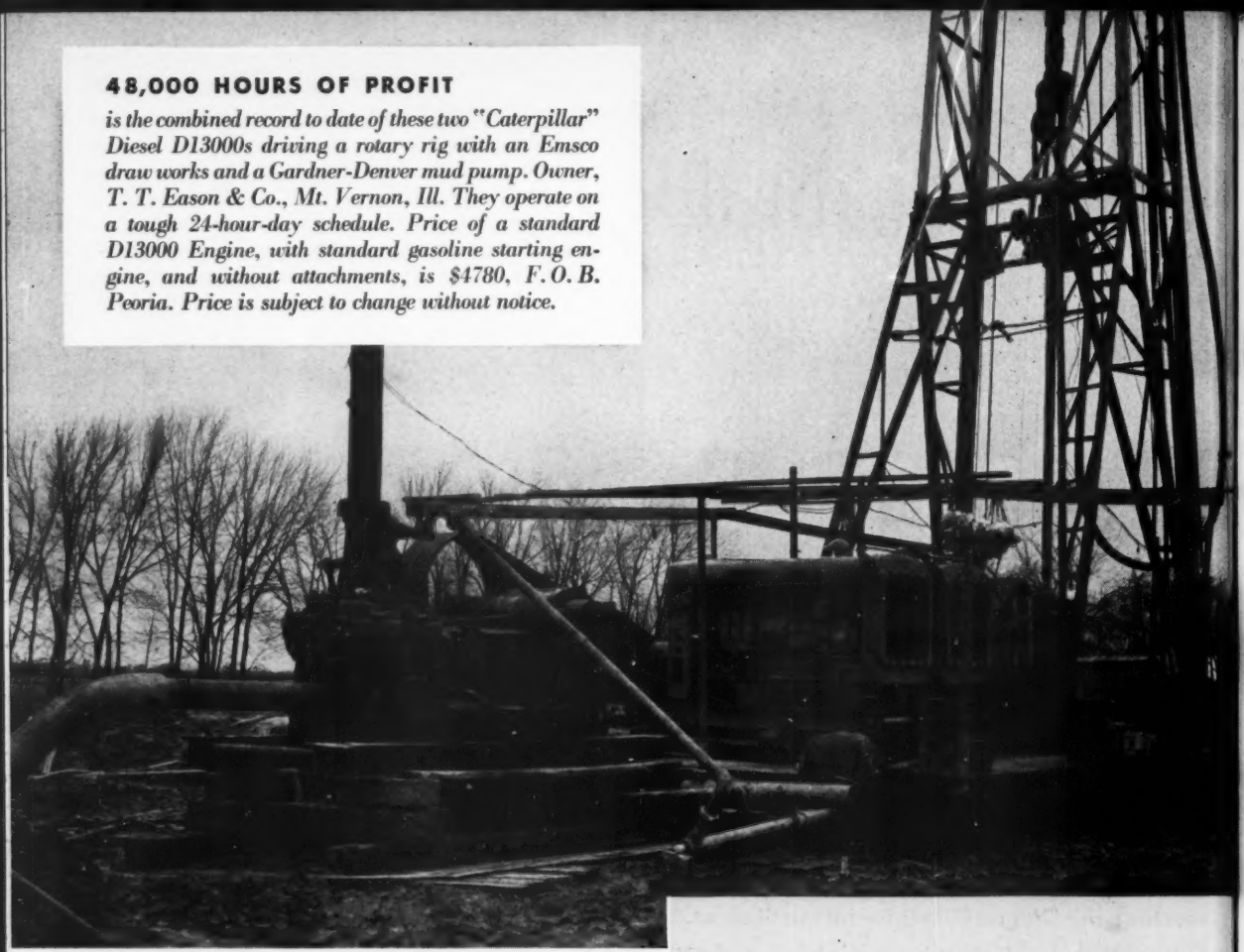
Impingement of dirty air against oil, deposits the heavier dust particles immediately. Oil and air mixture then passes upward with whirling motion through vanes to succeeding cleaning steps.



AAF Cycoil® OIL BATH AIR CLEANER
AND INTAKE SILENCER

48,000 HOURS OF PROFIT

is the combined record to date of these two "Caterpillar" Diesel D13000s driving a rotary rig with an Emsco draw works and a Gardner-Denver mud pump. Owner, T. T. Eason & Co., Mt. Vernon, Ill. They operate on a tough 24-hour-day schedule. Price of a standard D13000 Engine, with standard gasoline starting engine, and without attachments, is $4780, F. O. B. Peoria. Price is subject to change without notice.



"CAT" Diesel owners don't guess

THERE are mighty few "ifs," "buts" or "maybes" when "Caterpillar" Diesel Engines take on a drilling job. Hole usually goes down, "come hell, rock or high water." As Driller Storveck, of T. T. Eason & Co., picturesquely puts it, "I'd rather use 'Caterpillar' Engines than any other make. They've got plenty of power, and they stand up like the Rock of Gibraltar."

It's the sort of sentiment expressed by "Caterpillar" users the world over . . . because they don't have to guess. They *know* their engines are DEPENDABLE—fundamentally, because they're built well; secondly, because they're backed up by an expert and thoroughly equipped dealer organization that's always available to watch over them and to provide quickly any parts or mechanical service they may need during their long life.

For interesting descriptive and case-history literature about "Caterpillar" Diesels in the oil fields, send in this coupon. There is no obligation.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

CATERPILLAR REG. U. S. PAT. OFF.
DIESEL ENGINES • TRACTORS MOTOR GRADERS EARTHMOVING EQUIPMENT

CATERPILLAR TRACTOR CO.
PEORIA, ILL.

Send price, model and oil-field literature about "Caterpillar" Diesel Engines. OG-4

*Name*_____

*Address*_____

Patterson-Ballagh pipe wipers give...

wear resistance...

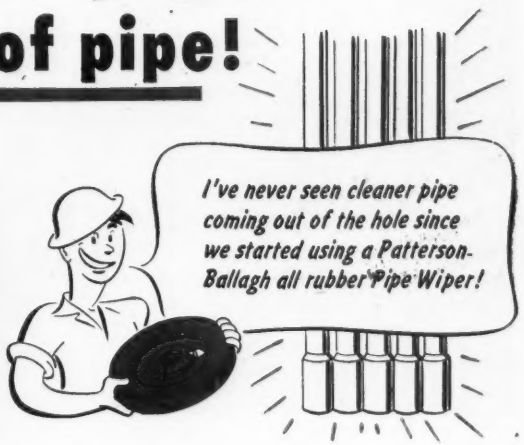
tear resistance...

a clean string of pipe!

TANDEM

STANDARD

WINDOW



The TANDEM—made of tough wearing interchangeable halves held together with tapered self-locking rubber pins—efficiently wipes pipe, with flexible, positive action. Even when the operator is using oversize tool joints, which require oversize protectors, the TANDEM Pipe Wiper allows these to pass with minimum effort. Eight new rubber pins come with each replacement half.

Patterson-Ballagh Pipe Wipers are available in several single styles for regular and special oilfield uses. See any one of our field representatives, or send for your copy of the descriptive Patterson-Ballagh Catalog.

PATTERSON-BALLAGH · SEAL OF QUALITY · OIL FIELD · SPECIALTIES ·

Specify

PATTERSON-BALLAGH

DIVISION OF BYRON JACKSON CO.

PIPE WIPERS

22 years of service to the oil industry

MAIN OFFICE: 1900 East 65th St., Los Angeles 1, California

6247 Navigation Blvd., Houston 11, Texas · 808 Graybar Bldg., New York 17, N. Y. · 330 Russ Bldg., San Francisco 4, Calif.
T.I.P.S.A., Santiago Del Estero 286, Buenos Aires, Argentina · A. R. Boyd, Edmonton, Alberta, Canada

"No expense...in 20,000 miles...with FORD F-8 BIG JOB!"

ROADSIDE REPORT

FORD TRUCKS

O. E. HELLING

PIPESTONE, MINNESOTA

"WE HAVE DRIVEN the FORD F-8 Big Job some 20,000 miles with no expense, except the regular servicing, such as changing oil, greasing, etc," reports Mr. O. E. Helling, Manager of the Hicks Oil Company. "This unit has traveled on gravel and blacktop in all parts of Minnesota, pulling a 5245-gallon gasoline tanker. Gasoline mileage has been 5.5 miles per gallon. We feel this is very good considering the load and road. We recommend the Ford F-8 Big Job to any operator who needs 'Big Power.'"

With Mr. Helling, as with thousands of other extra heavy duty truck users, the new Ford 145-horsepower Big Jobs are all the go! One reason why . . . engine power second to none in its class. Second reason . . . the luxury of the new Ford Million Dollar Cab. Third reason . . . Bonus Built construction, a feature of every one of over 139 Ford Truck models. Bonus Built is the superstrong construction that contributes to long truck life. Life insurance experts prove Ford Trucks last longer!

ONLY THE FORD BIG JOB HAS ALL THESE FEATURES!

- ★ New 145-h.p. Ford V-8 engine for top performance.
- ★ Ford exclusive concentric dual-throat carburetor for more power, more economy.
- ★ New heavy duty 5-speed transmissions for operating flexibility.
- ★ Big Ford power-operated brakes for sure-footed stopping; rear 16-inch by 5-inch in the F-8.
- ★ Ford Super Quadrax 2-speed axle with vacuum shift for performance flexibility in Model F-8 (single speed axle also available); single-speed Quadrax Hypoid Axle in Model F-7.
- ★ Large diameter (10-inch) wheel bolt circle with 8 studs to allow for extra-strong hub construction.
- ★ Million Dollar Cab with Ford Level Action suspension for greater driving comfort.
- ★ Nationwide service from over 6,400 Ford Dealers.
- ★ Ford Bonus Built construction for long truck life.

Gross Vehicle Weight Ratings: F-8 up to 21,500 lbs., F-7 up to 19,000 lbs. Gross combination ratings: F-8 up to 39,000 lbs., F-7 up to 35,000 lbs.

FORD 1949 *Bonus Built* TRUCKS 1959

BUILT STRONGER TO LAST LONGER

USING REGISTRATION DATA ON 5,444,000 TRUCKS, LIFE INSURANCE EXPERTS PROVE FORD TRUCKS LAST LONGER!

McKee Engineering Service

to the Petroleum Processing Industry is

World Wide

McKEE is currently engaged in engineering projects for the Petroleum and Iron and Steel industries in the United States and *twelve foreign countries.**

The broad facilities and ample resources of the McKee organization enable us to undertake all phases of plant design, engineering, material procurement and construction of refinery projects of any size in any domestic or foreign location.

*Argentina	Egypt	India
Brazil	England	Italy
Canada	France	Mexico
China	Holland	Venezuela

ARTHUR G. McKEE & COMPANY

GN, ENGINEERING AND CONSTRUCTION FOR THE PETROLEUM REFINING AND IRON AND STEEL INDUSTRIES

ENGINEERS AND CONTRACTORS • ESTABLISHED 1905
2300 CHESTER AVENUE, CLEVELAND
30 Rockefeller Plaza, New York, N. Y.

If you operate in Texas!

Texas is a big state with a big oil past and a bigger oil future.

Jones & Laughlin Supply Company does things in a big way in Texas, too, from one store at Electra in 1911 to 25 supply stores and 5 sales offices today. Each of these is a one-stop warehouse and/or service center manned and equipped to give you upright, outstanding cooperation.

For a type of service geared to back up a mighty industry in a mighty state, you can turn proudly to any Jones & Laughlin Supply store or office from Kermit to Kilgore and Borger to Corpus.

Note: This is the first of a series of advertisements featuring the geographical locations of Jones & Laughlin Supply stores. Watch for the ad that gives the store locations nearest your operations.

EXPORT: 230 Park Avenue, New York 17, N. Y., U. S. A.

These are your Jones & Laughlin Supply Stores and Offices in Texas

★Alice
●Amarillo
★Anson
★Beaumont
★Best
★Big Spring
★Borger
★Corpus Christi
●Dallas
★Electra
●Fort Worth
★Freer
★Gladewater
●★Houston
★Kermit
★Kilgore
★Longview
★Luling
★Mexia
●Midland
★Muenster
★Odessa
★Olney
★Overton
★Pampa
★Pleasanton
●San Antonio
★Sundown
★Talco
★Wichita Falls

★ STORES ● OFFICES

JONES & LAUGHLIN SUPPLY COMPANY

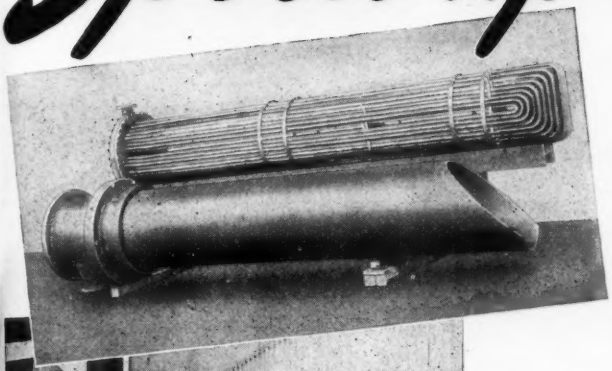
Subsidiary of Jones & Laughlin Steel Corporation

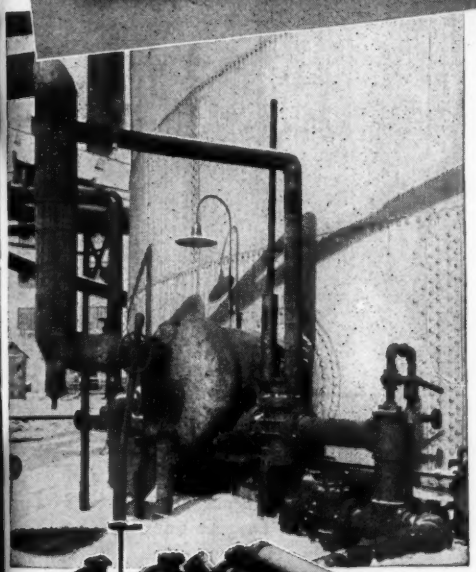
TULSA, OKLAHOMA

J&L STEEL

Speed up Oil Flow

WITH Vogt UNIT TANK HEATERS*

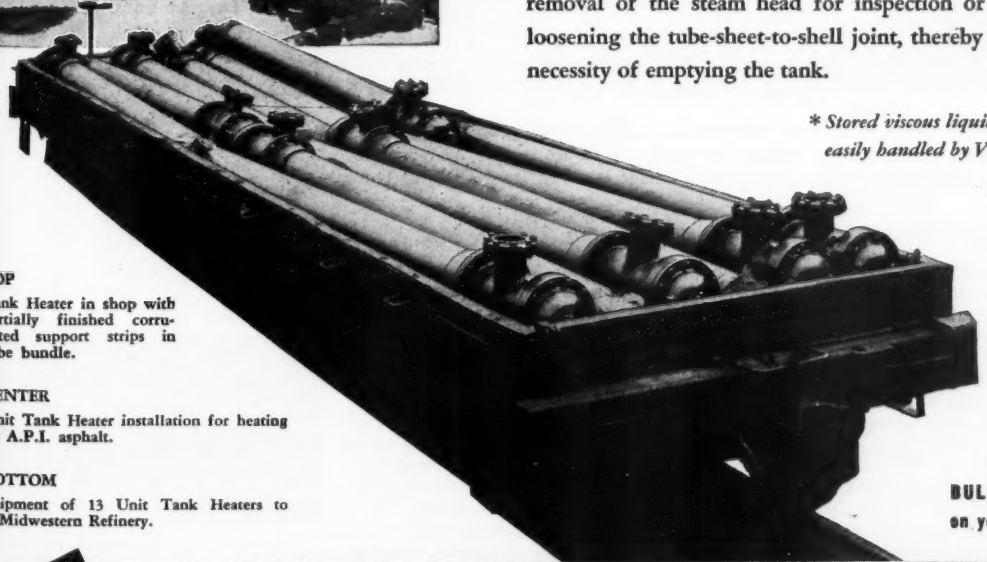




SAVE TIME AND MONEY with Vogt Tank Heaters! They permit pumping to be started shortly after steam is admitted since only the small quantity of oil lying in the shell of a unit needs to be heated. As hot oil is withdrawn it is replaced by cold oil from the tank through the open end of the heater shell. Steam consumption is held to a minimum since *only* the oil removed from the tank is heated.

Standard Type U Heaters have nests of "U" bend tubes made from 1¼" seamless steel or 1" electric welded pipe, as desired. These are rolled firmly into tube sheets having double grooved tube holes. Corrugated strips support the tubes without impediment to the oil flow. Collar bolts permit removal of the steam head for inspection or repair without loosening the tube-sheet-to-shell joint, thereby eliminating the necessity of emptying the tank.

** Stored viscous liquids of any kind are easily handled by Vogt Tank Heaters.*



TOP
Tank Heater in shop with partially finished corrugated support strips in tube bundle.

CENTER
Unit Tank Heater installation for heating 12 A.P.I. asphalt.

BOTTOM
Shipment of 13 Unit Tank Heaters to a Midwestern Refinery.

Write for BULLETIN HE-4 on your letterhead

Vogt FOR BETTER HEAT EXCHANGERS

HENRY VOGT MACHINE CO., INC., LOUISVILLE 10, KY.

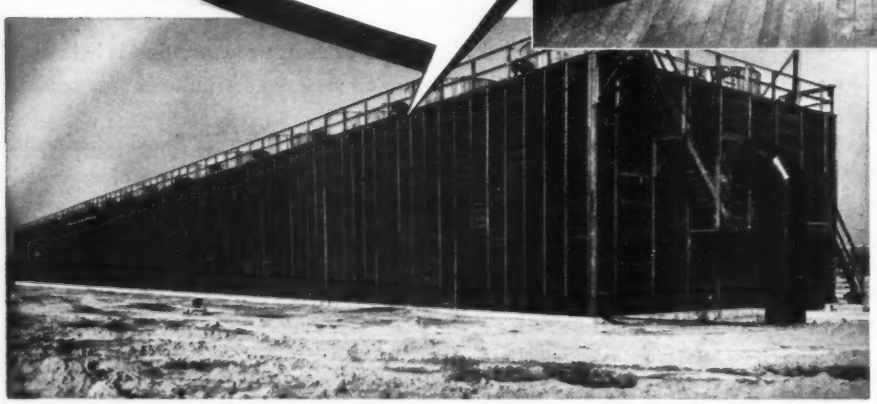
Branch Offices: NEW YORK · CHICAGO · CLEVELAND · PHILADELPHIA · DALLAS

HERE IT IS!

...THE NEW MULTI-STAGE COOLING TOWER

...the Result of 10 Years of Research and EXHAUSTIVE TESTS

...FOR THE WORLD'S LARGEST LUBE PLANT



Top view of the 48'-0" wide x 408'-0" long x 28'-6" high, 34-cell, Multi-Stage Cooling Tower designed and erected for the World's Largest Lube Plant.

51,000 Gallons of water per minute . . . 3,060,000 gallons of water per hour . . . 73,440,000 gallons of water per 24-hour day . . . cooled to a guaranteed temperature with this 34-cell Multi-Stage Induced Draft Cooling Tower.

NEW IN *ENGINEERING* . . . IN *PERFORMANCE* . . . *ADAPTABILITY*

The above installation represents not only new designing to meet the requirements of the Petroleum and Chemical Industries, but is the results of 10 years of research and testing to meet the trends towards higher efficiency in Cooling Tower performance with increased temperature ranges and closer approach to the ambient wet bulb temperature. Water Cooling Equipment Company Engineers have created the above Multi-Stage Cooling Tower which attacks a hard cooling condition and solves the problem by breaking it into easier cooling conditions which are easier to accomplish. It is, in effect, two or more Cooling Towers operating in series within a SINGLE enclosure and operated with a SINGLE pumping of the water. The internal arrangement provides the serial flow of all the water from one bank of Filling to another, permitting intimate contact with separate streams of outside ambient air in counterflow through each bank. The IMPORTANT factor in this Cooling Tower is..a high water-to-air ratio is maintained making it possible to increase greatly the enthalpy of the outgoing air over that even theoretically possible with the single pass arrangement in either counterflow or cross-flow Cooling Towers. This is an engineering triumph.

TODAY'S WATER COOLING PROBLEMS CANNOT BE SOLVED WITH YESTERDAY'S METHODS

WATER COOLING EQUIPMENT CO.

NEW HAMPSHIRE AND GEORGIA • ST. LOUIS 23, MO.

FULL INFORMATION UPON REQUEST

SERVCO

Trade Mark

Non-magnetic "K" MONEL Collars

BRING THESE 4 ADVANTAGES to your Drilling Hook-ups

1. INCREASED SURVEY ACCURACY

Records are made in center of bore hole—free of magnetic effect of drill string.

When located in "K" Monel collar, survey instruments are properly aligned with course of hole.

Surveys made in Servco collars indicate current trend of the hole because the record is made with the bit on the bottom.

2. SAVE RIG TIME

Servco "K" Monel drill collars provide for positive positioning of survey instrument. Save time lost in spudding and pick-up. No need for an extra round trip of sand line to pull a center bit.

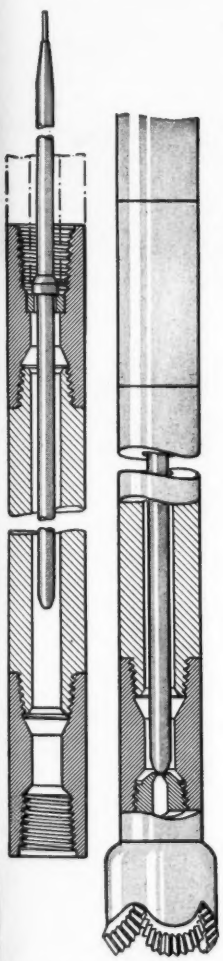
Survey instrument can be go-deviled, and retrieved with the drill pipe or with an overshot on wire line. While survey instrument is being go-deviled, Kelly can be made up, and rotation and circulation maintained until picture interval. Get survey records while retrieving center bit or core barrel.

3. HIGH PHYSICALS

"K" Monel gives you high physical properties: A yield point of 103,000 psi., tensile strength of 137,000 psi., elongation of 25% in 2", and Brinell Hardness (3000 Kg.) of 300.

4. REMAINS NON-MAGNETIC

"K" Monel remains non-magnetic at temperatures down to —100° C and does not become magnetic through cold working. Its maximum permeability is 1.02 compared with air which has a permeability of 1.00.



SURVEY INSTRUMENTS in recording position in Servco "K" Monel Drill Collar. (Left) Top landing. (Right) Landed on bit. Drawings and operating data, courtesy of Servco Corporation, Long Beach, Calif.

You can save time and money in directional drilling or straight hole control with *Servco* collars.

Designed for use in any drilling hook-up, they're made of "K"* Monel, a permanently non-magnetic nickel alloy with physical characteritics comparable to those of high grade steels.

"K" Monel collars help give you accurate recording. What's more, they eliminate the need of round-tripping pipe to get an open hole survey record. You run the collar immediately above your regular bit or reamer—run it right where it's in good position to show the latest trend of your drilled hole.

When you want a directional record, you simply run the survey instrument on a wire line, or go-devil it through the drill pipe to a fixed, positive seat inside the bore of the collar.

There's no problem. No running of specially designed bits so you can pass the survey instrument into open hole. (As you've probably discovered, special bits are likely to be more hazardous and less efficient than conventional types. And it's worth noting that "K" Monel collars come in all popular sizes, equipped with conventional tool joints. You can choose the bit for your job solely on its ability to *drill!*)

"K" Monel brings to Servco Drill Collars—as it does to so many other types of oil field equipment—continuous and reliable operation under conditions that rapidly weaken and destroy less rugged metals. In addition to being strong, tough and corrosion-resistant, "K" Monel has a magnetic permeability only slightly more than that of air. And it is not affected by increasing hole temperatures.

Complete information about *Servco* "K" Monel Drill Collars, including tables that give sizes and physical properties, are contained in a booklet offered you by the manufacturer. For your copy, write SERVCO CORPORATION, 904 Security Building, Long Beach 2, California.

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street, New York 5, N.Y.

*Reg. U. S. Pat. Off.

EMBLEM OF SERVICE INCO TRADE MARK

"K" MONEL ...YOUR PARTNER IN PROGRESS

YOUR *Distributor* SERVES YOU BEST

Super Excelo TRANSMISSION BELTING FOR HARDEST STRESSES AND STRAINS

• Today's production requires the highest degree of strength and endurance in transmission belting. The belting must pull any number of wells that pumping units are designed to operate. It needs to withstand constant racks, tugs and jolts. The belt should be equal to operations under maximum loads. The belting must stand up, thereby preventing costly delays . . . AND REPUBLIC'S SUPER EXCELO BELT WILL DO ALL OF THESE THINGS. Super Excelo is a homogeneous structure that resists fatigue and can take external and internal punishment constantly. It keeps operating costs at their lowest. Ask your distributor for Republic transmission belting.

MECHANICAL RUBBER GOODS BY
REPUBLIC RUBBER DIVISION

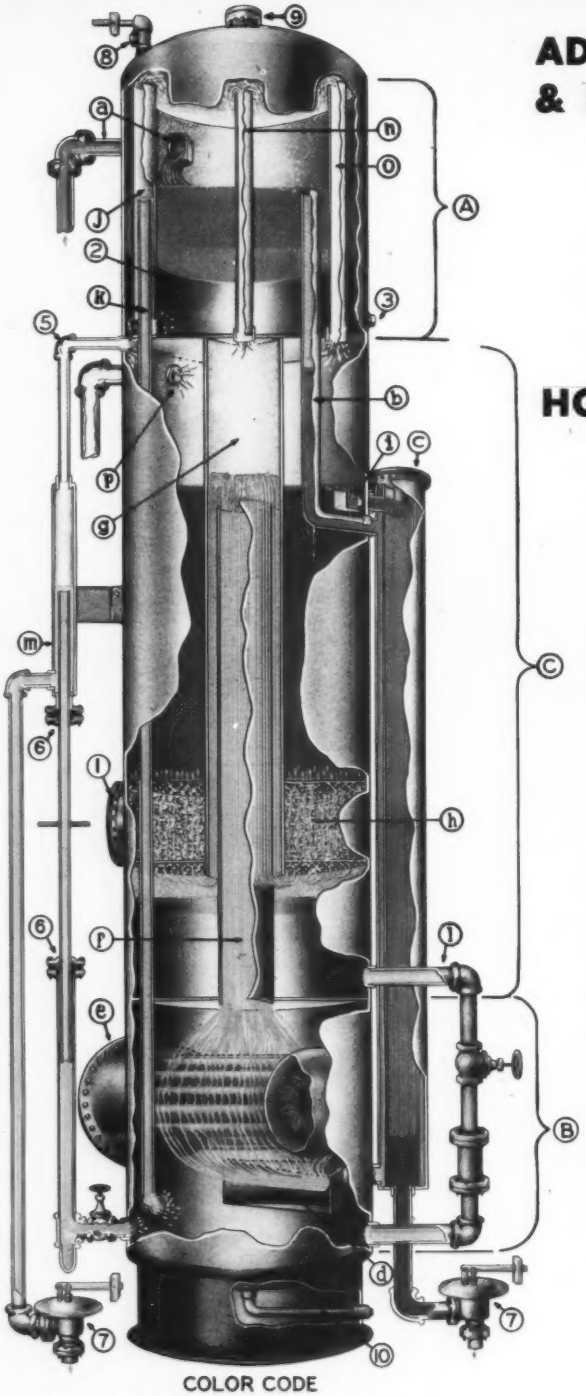
REPUBLIC RUBBER DIVISION
LEE RUBBER & TIRE CORPORATION . . . YOUNGSTOWN, OHIO
Lee DeLuxe Tires & Tubes, Conshohocken, Pa.

Type F Treaters

Handles Tough Emulsions Faster

B S & B Treaters are engineered to save production time by shortening shutdowns, to deliver the maximum output of gas and oil of highest gravity to tanks at the lowest cost per barrel. B S & B Type F Treaters are available in four standard sizes . . . 4, 6, 8 and 10 ft. diameter by 28-ft. shell length. Call your nearest B S & B Sales Representative today for complete information, or write the Oil Field Equipment Division, Black, Sivalls & Bryson, Inc., Power and Light Building, Kansas City 6, Missouri.

Black, Sivalls & Bryson, Inc.



COLOR CODE

● EMULSION ● WATER ● TREATED OIL GAS

ADVANTAGES OF BLACK, SIVAL & BRYSON TYPE "F" TREATERS:

Separate Drainage of each of three Treater C partments—Firebox Inspection can be completed *less than an hour*—entire job of removal, inspect cleaning, replacement and resumption of produc can be done in *less than four hours* by *two men*—Hig gas separating capacity—Large settling section—Gr er heating capacity!

HOW IT WORKS

Production from well enters classification section (A), thro side inlet (a). Cold gas separates from liquid. Emulsion water stratify in free water knockout part of section.

EMULSION

Emulsion flows from classification section through condu pipe (b) to outside heat exchanger (c). From heat excha emulsion passes into heating section (B). It is discharged heating section through distributor pan (d) under remov firebox (e). Emulsion is heated as it passes upward through water bath around firebox. Heated emulsion moves up through flume (f). Gas evolved from heating is allo to escape at top of flume. Gas-free emulsion flows down through outer flume (g), and is finally discharged into settling section (C). Final separation of emulsion into tre oil and water is completed in this section. Oil passes up through filter bed (h). Treated oil is removed through outl to heat exchanger (c). It passes to stock tanks as treated

FREE WATER

Free water, which has accumulated in classification se passes through fixed syphon (j), down conductor pipe, to of discharge near bottom of treater. Small particles of oil may be entrapped in free water are freed and pass into sion stream around firebox. Some water, due to heating, separate from emulsion in heating section and remain in part of treater. Water that is separated in settling se passes back to bottom of treater through outside water izer pipe (l). All of water accumulated during treater oper is now at the bottom of treater, and is withdrawn through side adjustable water syphon (m).

GAS

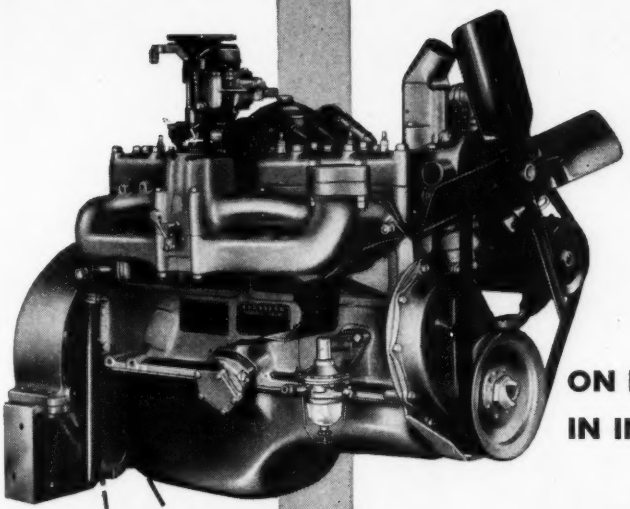
When original well stream entered classification section gas was separated from liquid. Hot gas, freed when emu was heated, passes upward through flume (f) and gas equ pipe (n) to classification section. Hot gas mixes intimately the cold gas. The resulting cool mixture causes condensat light fractions which drop back into emulsion. Cool gas passes through pipe (o) to gas zone above oil settling se Here further condensation may occur. Dry gas is final moved through side outlet (p).

EFFICIENCY RELIABILITY

FOREIGN INQUIRIES INVITED Cable Address: BLACK, KANSAS CITY, U.S.A.

BLACK, SIVALLS & BRYSON, INC.

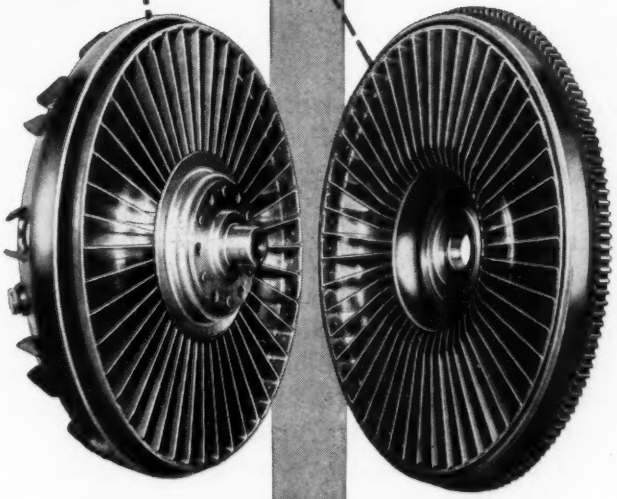
KANSAS CITY, MO. OKLAHOMA CITY, OKLA.



FOR A BETTER DAY'S WORK

ON FARMS—IN FORESTS—IN OIL FIELDS IN INDUSTRY AND ON THE HIGHWAYS!

Now available with *gýrol* Fluid Couplings!



● **You get the good things *first* from Chrysler! Now *gýrol* Fluid Couplings are available on Chrysler Industrial Engines for industrial applications. Here's the cushion of safety between power and load that is so greatly needed on tough jobs. This time-tested coupling prevents shock load, engine stalling, and eliminates declutching. It lengthens clutch life and makes for easier handling of equipment. Famous *gýrol* Fluid Coupling, complete with clutch, clutch housing and a 3 or 4-speed transmission is offered on Models 5, 6, 7, 8, and 12. See your Chrysler Industrial Engine dealer or write for information . . .**

INDUSTRIAL ENGINE DIVISION, CHRYSLER CORP.
12200 E. JEFFERSON, DETROIT 31, MICHIGAN

NATION-WIDE SERVICE

FACTORY-ENGINEERED AND TESTED PARTS WITH EXPERT MAINTENANCE WHEREVER YOU ARE

CHRYSLER

INDUSTRIAL ENGINES AND POWER UNITS

HORSEPOWER WITH A PEDIGREE

Need Field Housing *Today?*

MANUFACTURERS OF SPECIAL MILLWORK: DISTRIBUTORS OF JOHNS-MANVILLE BUILDING MATERIALS; CURTIS WOODWORK

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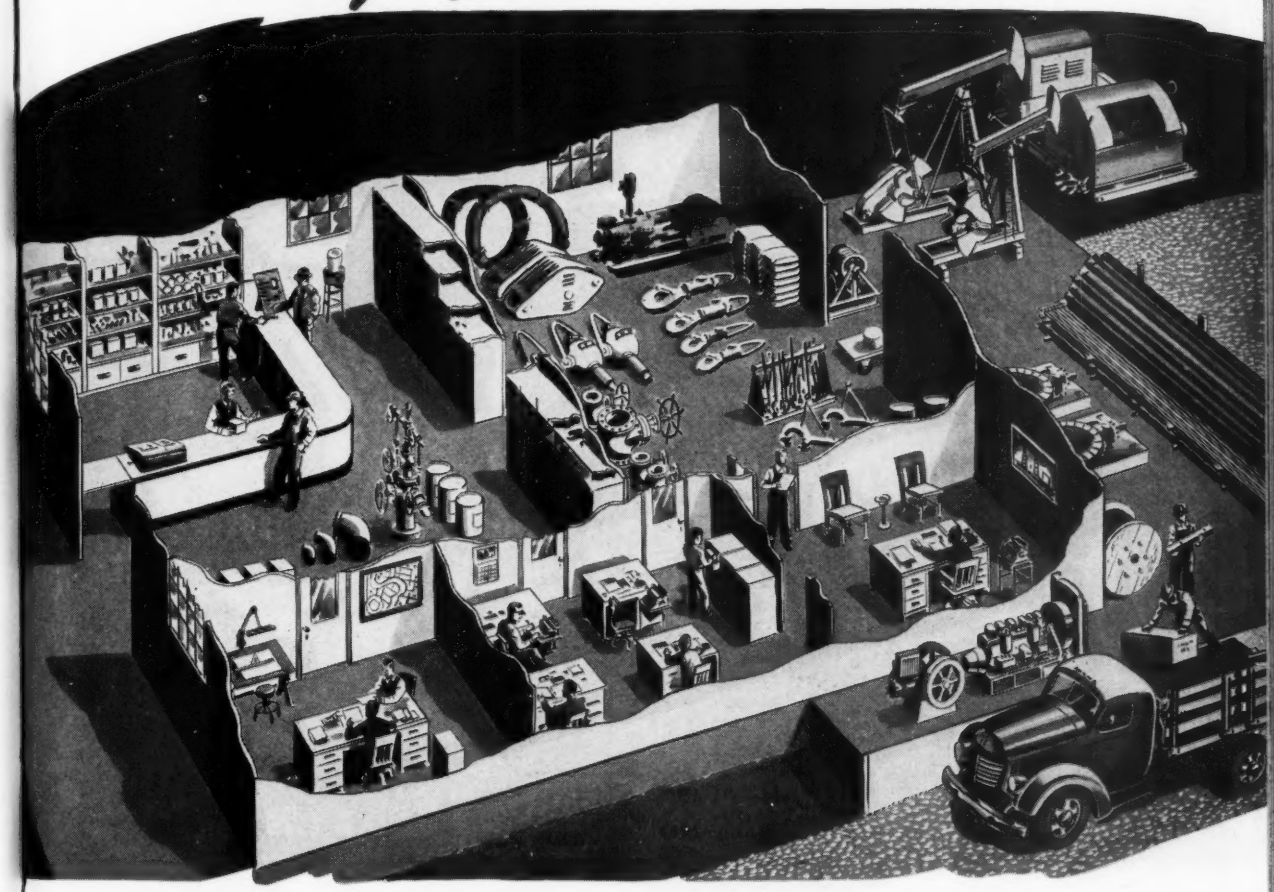

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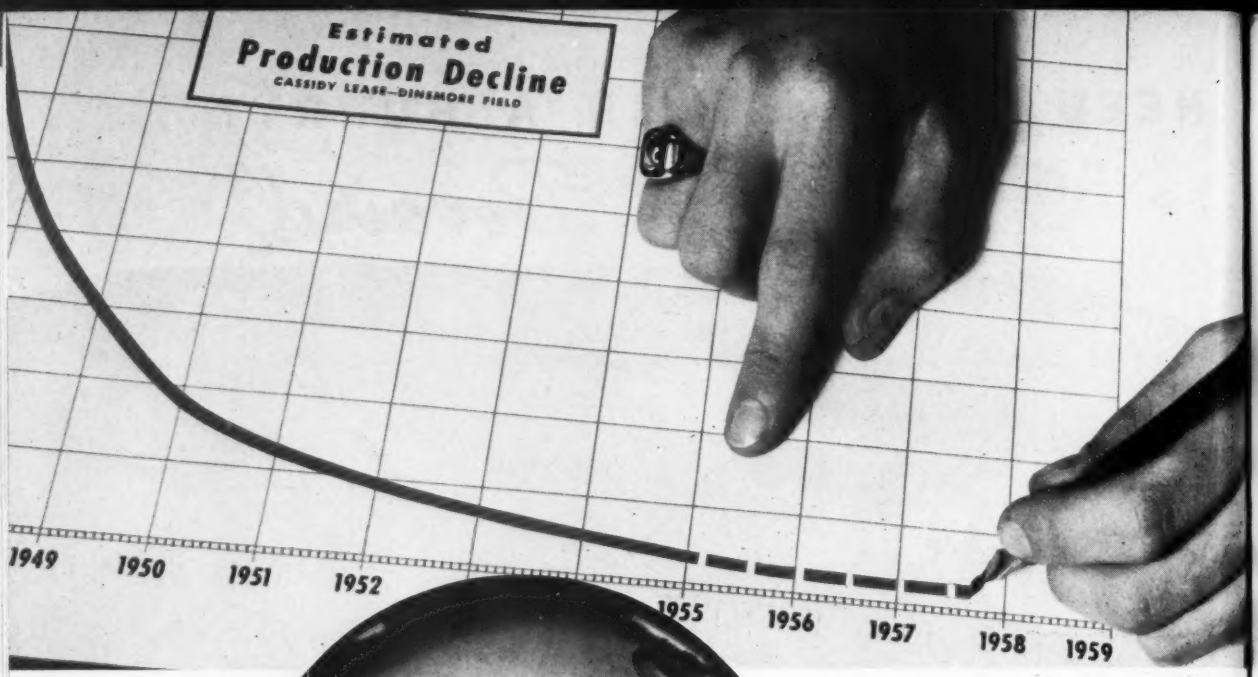

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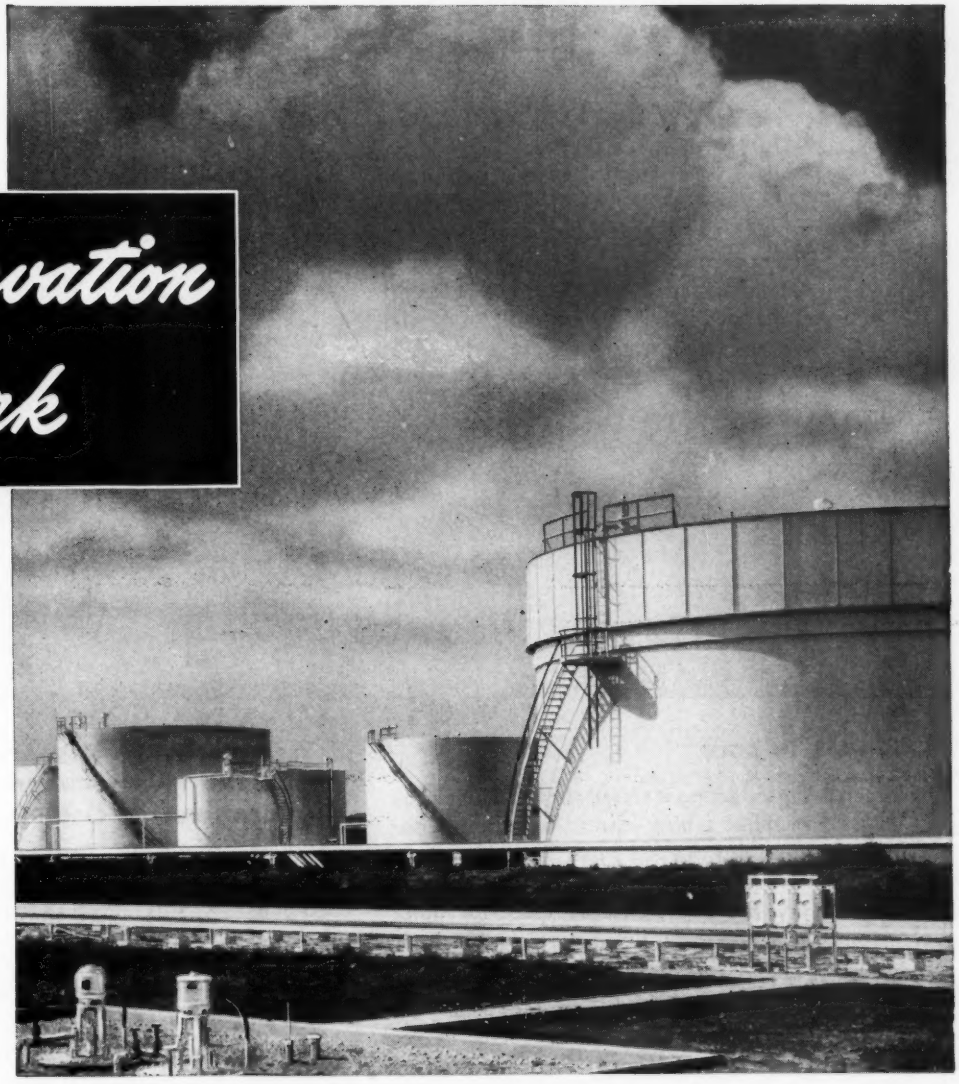
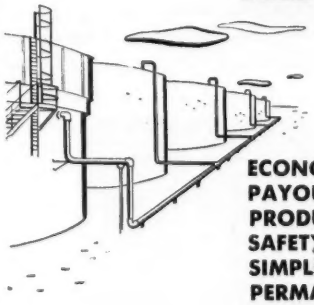


THE EXPANSION ROOF STOPS PROFIT LEAKS



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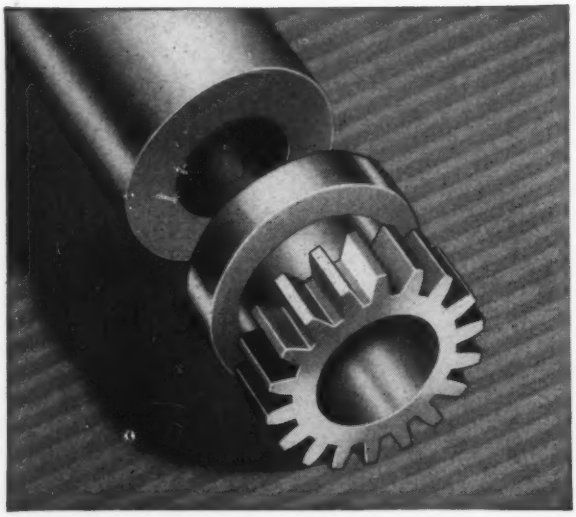

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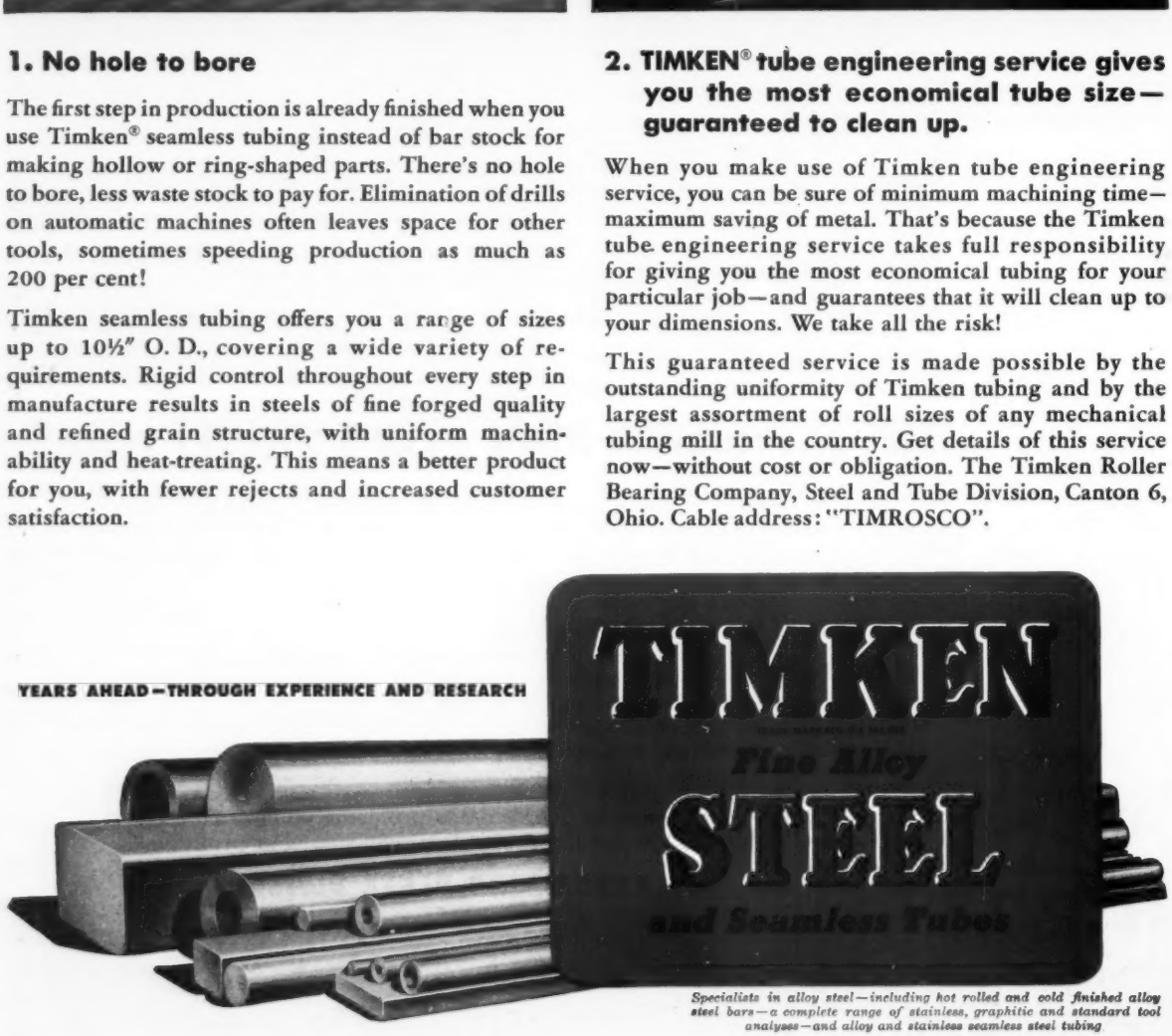

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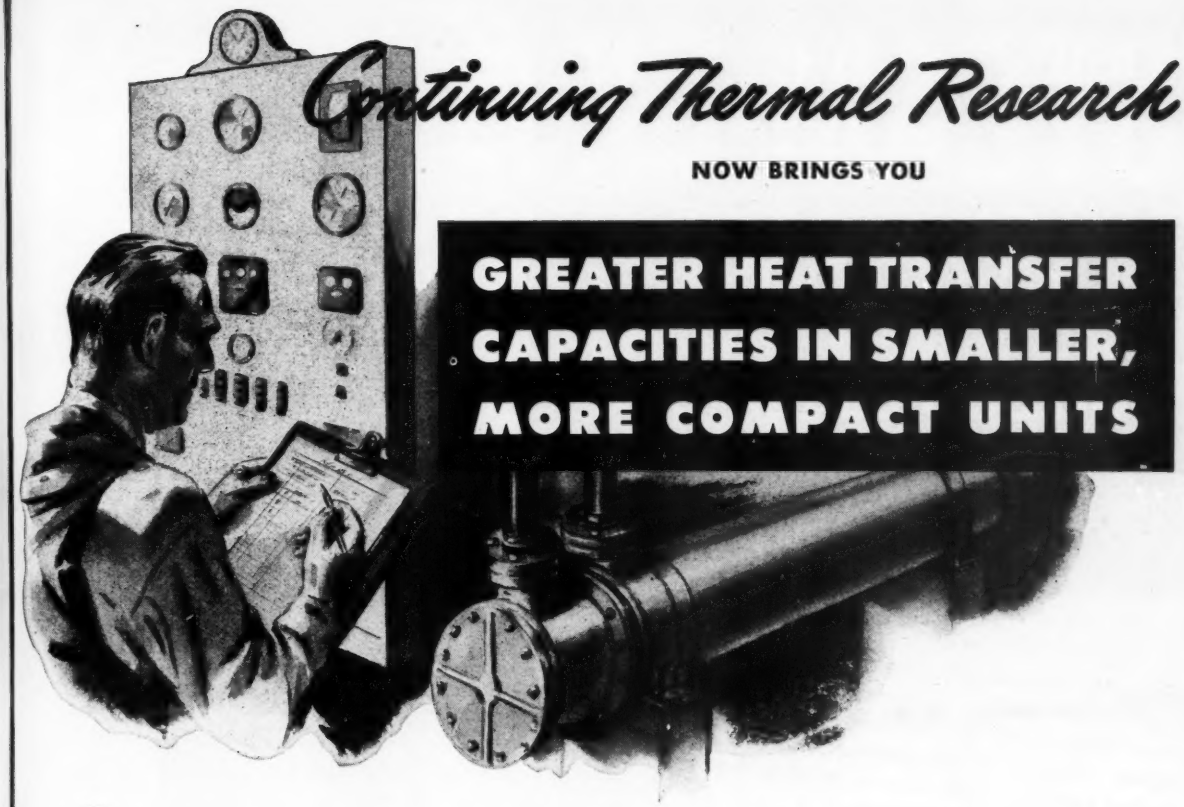

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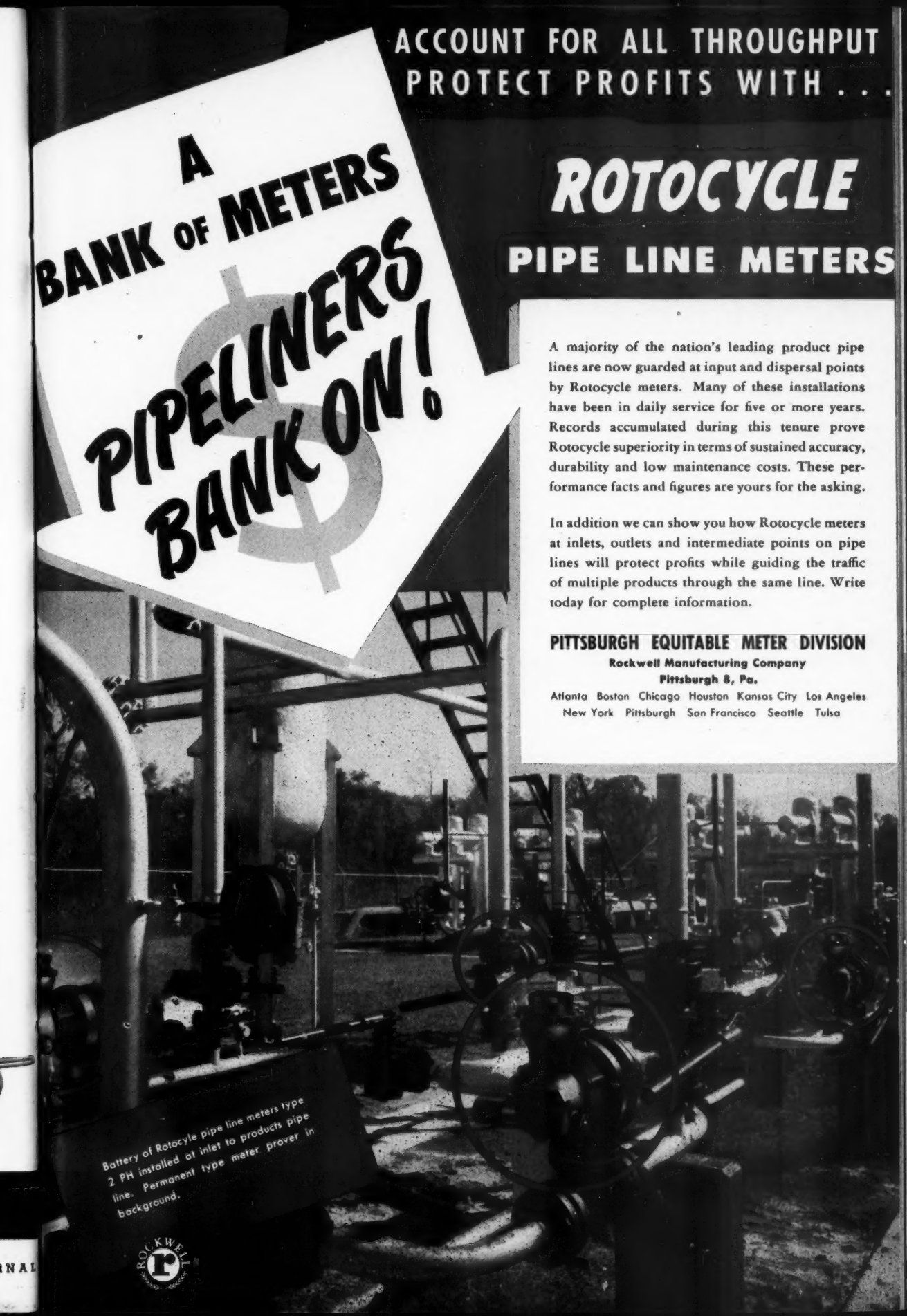
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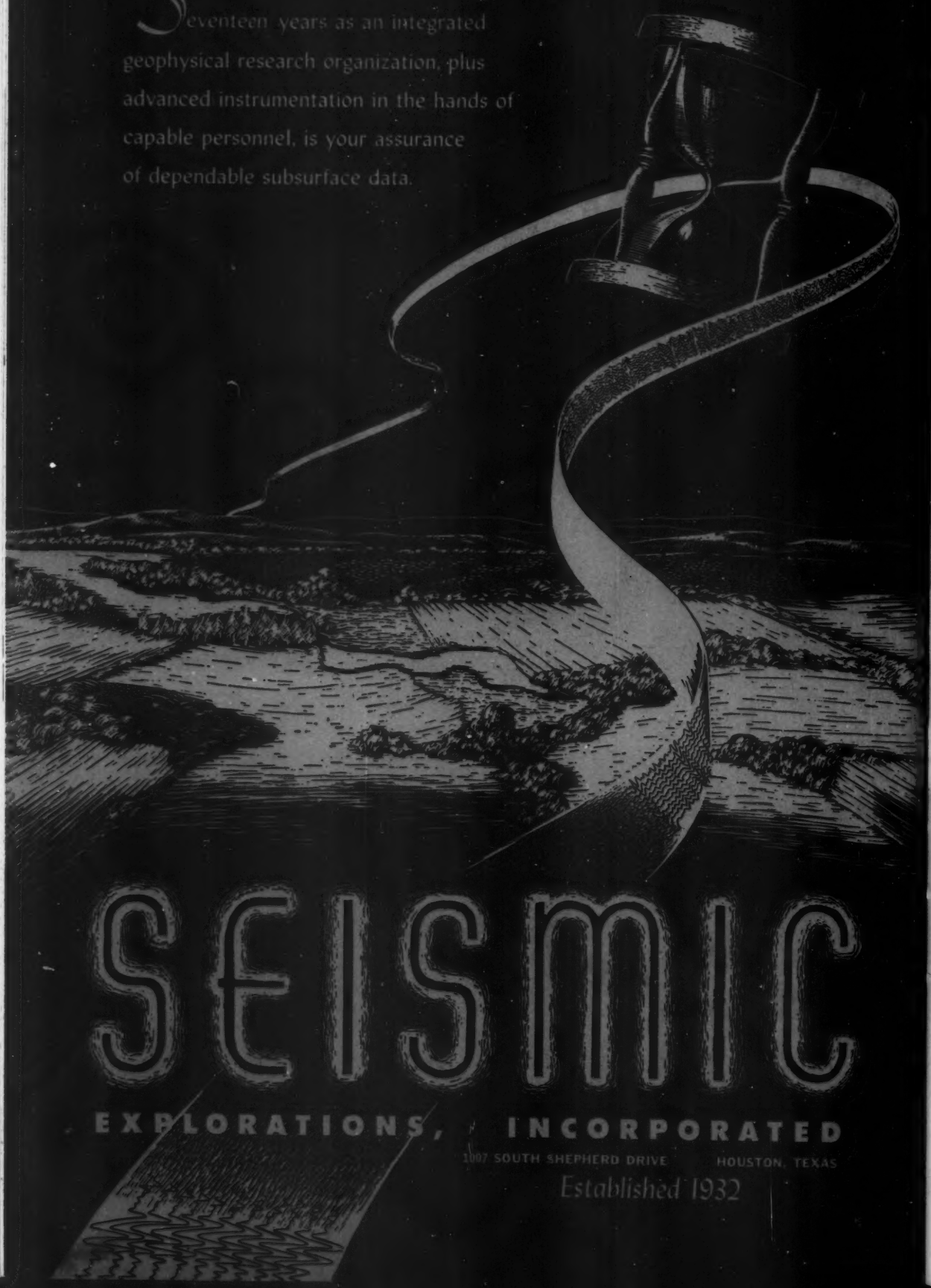

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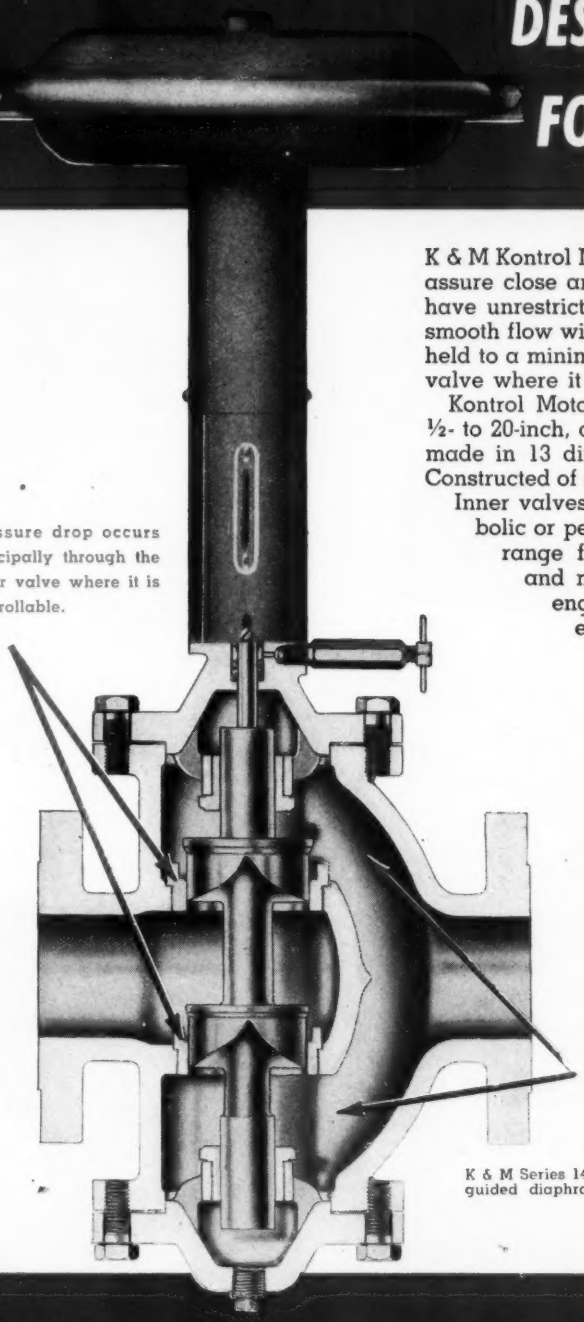
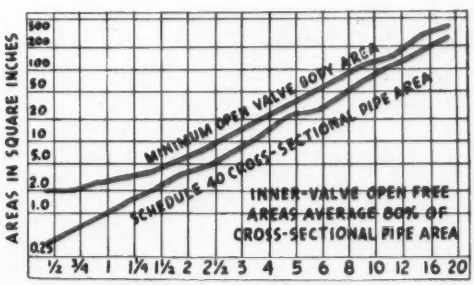
Pressure drop occurs principally through the inner valve where it is controllable.



K & M Series 1400 top-and-bottom guided diaphragm motor valve.



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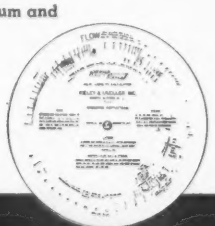

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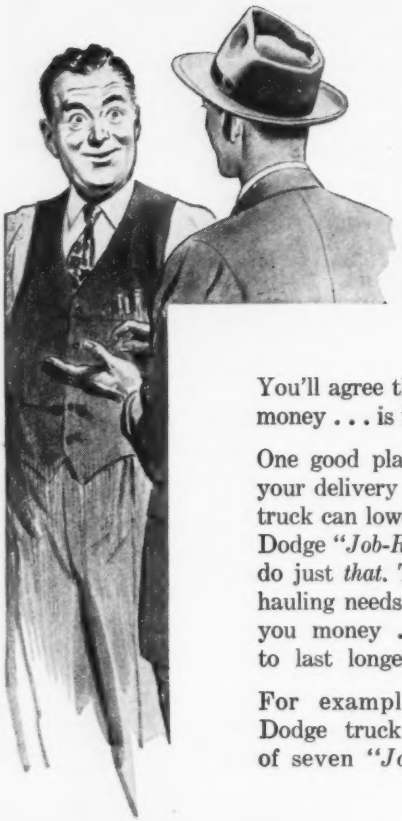

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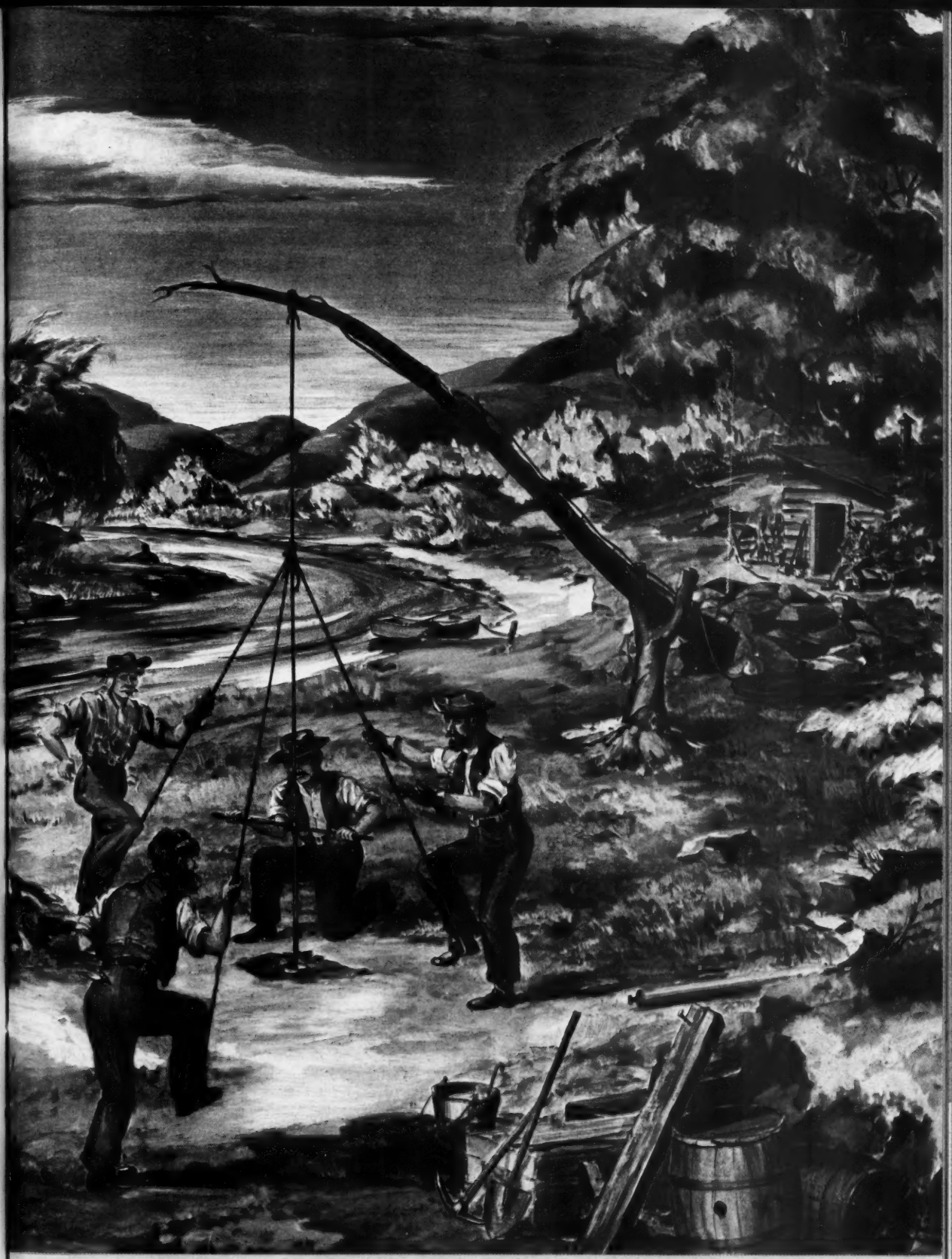

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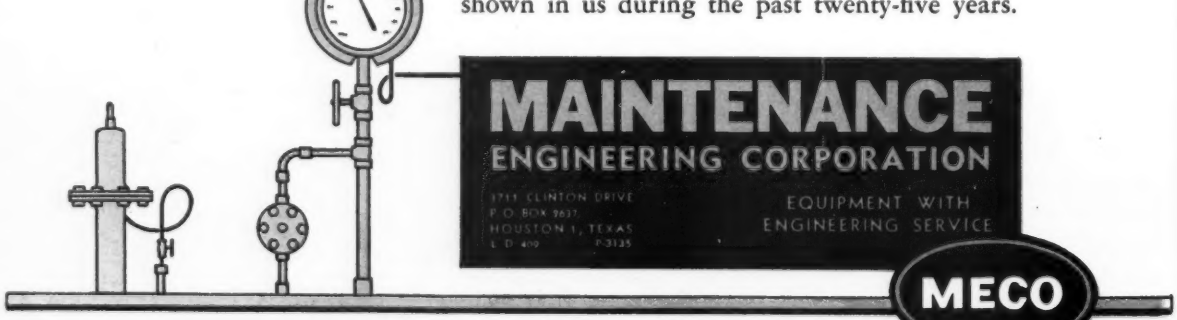

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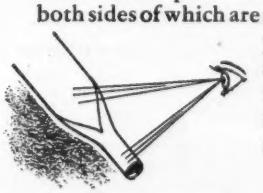
8. **Freedom from Scale**—Insures against clogged valves, contamination of petroleum products.
9. **Long Lengths**—Reduces number of joints—makes jobs move with longer strides.
10. **Inspected Inside and Out**—Republic Electric Weld Line Pipe is made from flat-rolled steel both sides of which are closely inspected. Thus, you are assured that the surface which becomes the inside wall when formed into pipe is free from hidden defects.



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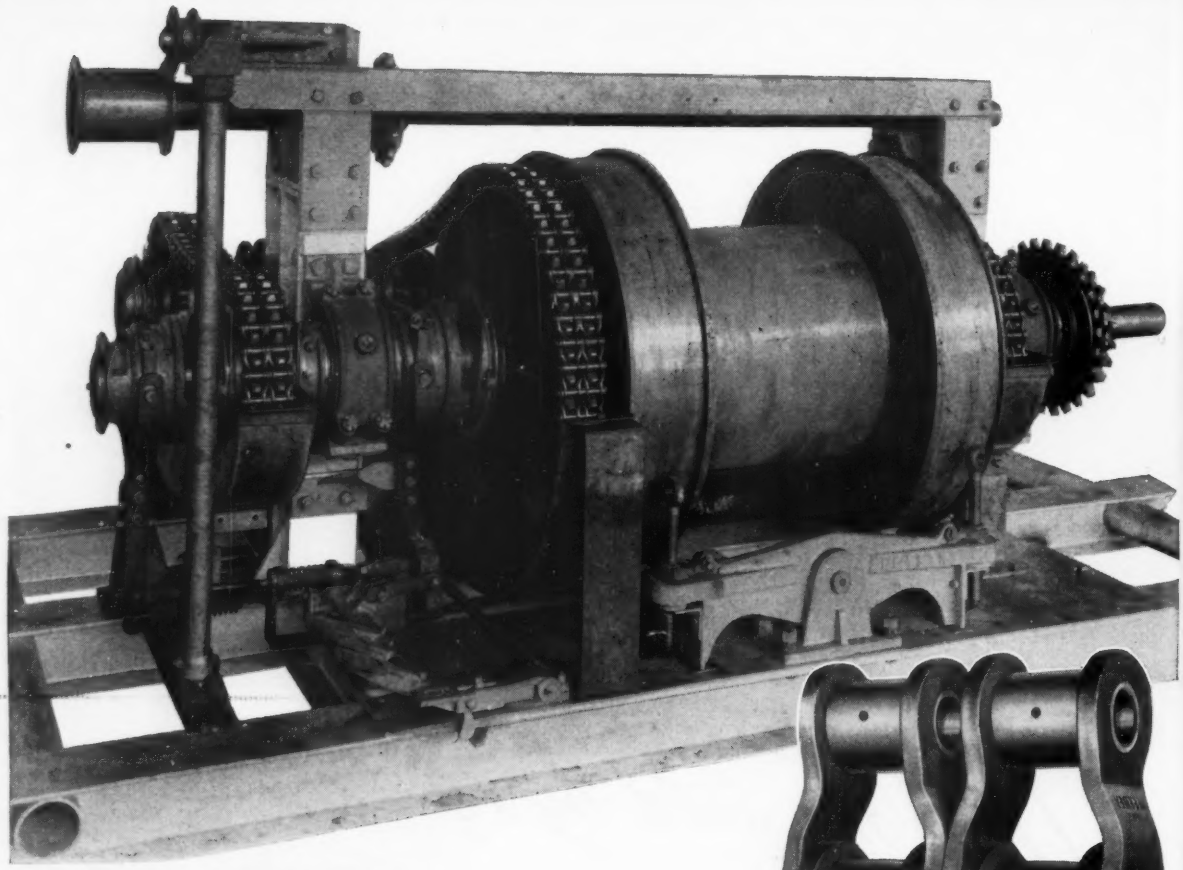

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T-49-3

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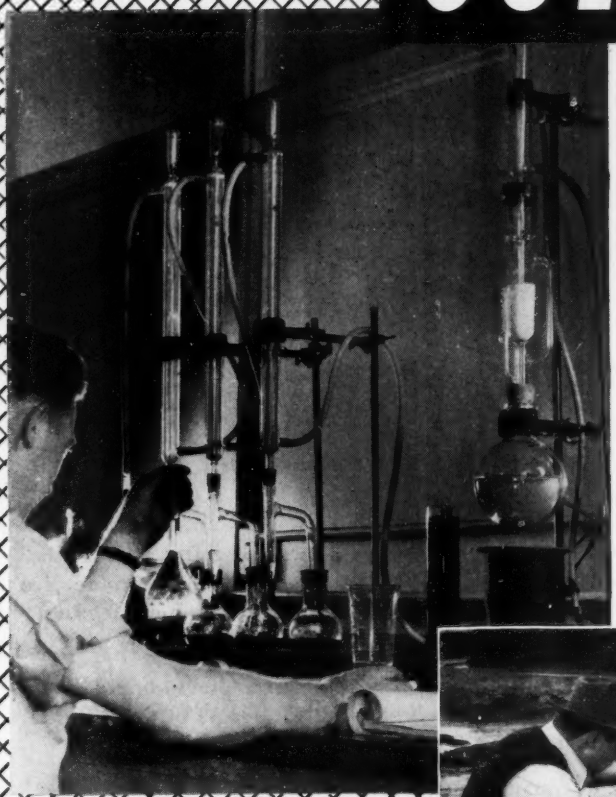

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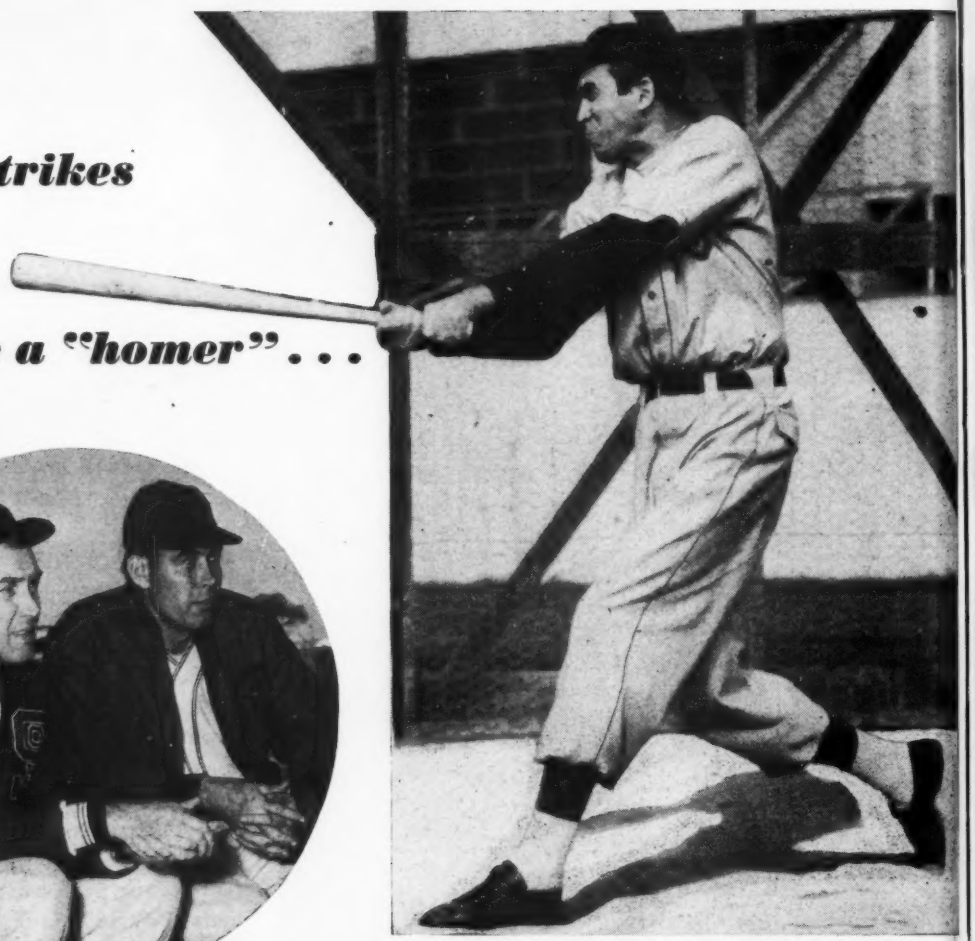

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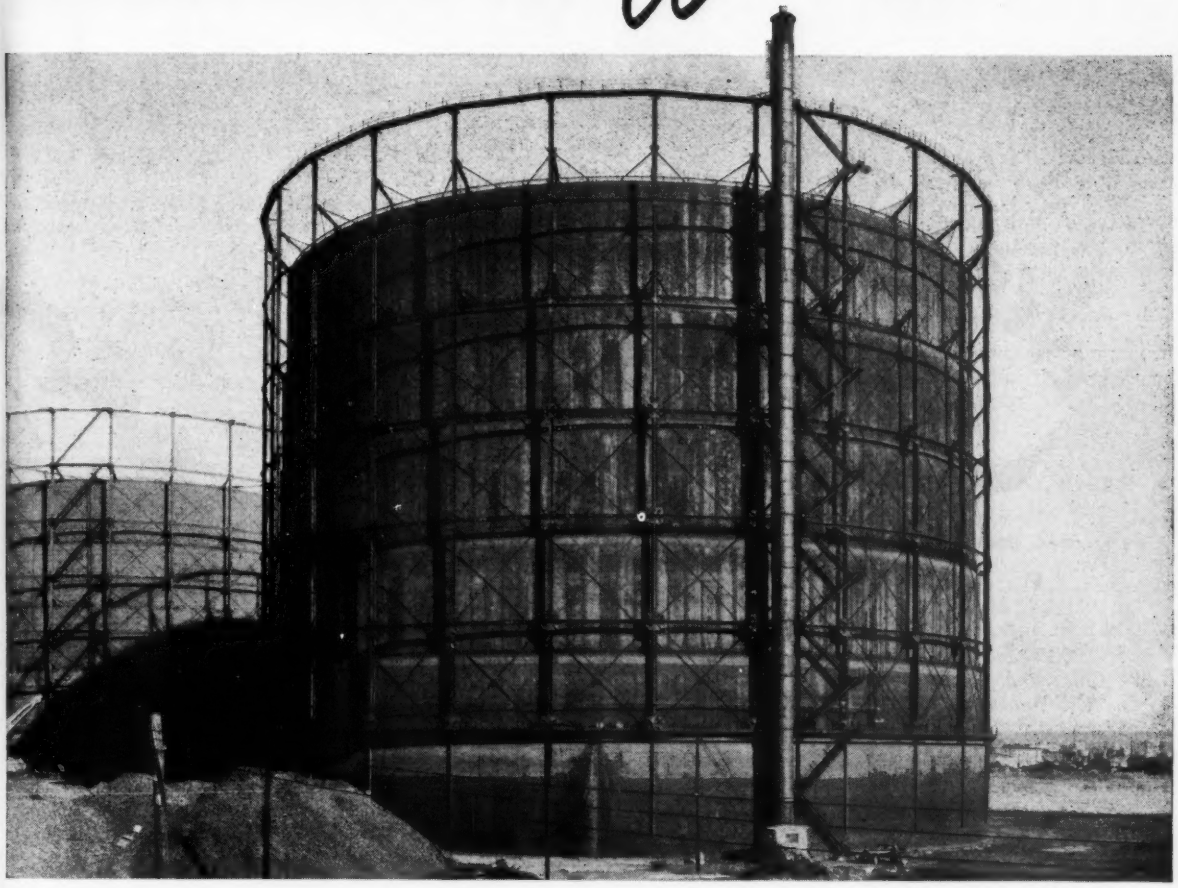

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Such statistics are impressive, of course, but we believe you'll be more interested in the *significance* of this outstanding installation—another in the long line of Stacey Brothers "Famous Firsts". Here's what we believe it all means to you:

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JOURNALLY Speaking

Down Under

"HORIZONTAL Drilling Increases Yield of Australian Oil Field," says a headline in our favorite oil publication. As we recall our grade-school geography, that place is on the bottom of the globe where winter comes in the summer, the trees shed their bark instead of their leaves, and everything is backwards, so it seems only reasonable that they would have to get at an oil sand from the bottom up instead of from the top down as we do on this side of the equator.

Spring Tonic

IN the spring the oil man's fancy lightly turns to conventions, it seems, and we surely are having a run of them these days. Our editors are junketing all over the map and, we suspect, sandwiching technical sessions in with what in dry Oklahoma is euphemistically termed a fellowship hour.

And our pages are full of papers, abstracts, digests, and reports of who said what and where. At times these coverages of meetings crowd out other things we would like to get into the book but after all we figure these convention discussions must be pretty important because is there any other reason a man would want to take a trip away from home this time of year?

The Report Reporter

ANOTHER thing that happens every spring, and which also is filling up a lot of our coveted white space is annual reports of oil companies. We boil 'em down to beat the band, but we figure that a lot of people besides the stockholders (who probably don't read them anyway) are interested in knowing what some other oil company did last year and is planning for the future.

Much of the stuff is ancient history, it is true, and was all faithfully recorded in the pages of our favorite oil publication at the time it happened, but a recap is often useful to attain perspective. Not being a financial magazine, we stick closely to the operating phases and pretty much ignore the balance sheets, but it is interesting to note that report after report explains the high earnings as due to a combination of unusual circumstances which probably can't be repeated because things cost so much more these days. These apologies for making so much money are probably designed to warn both the tax collector and the stockholders that the gravy train is slowing down.

National Debt, It Says

THE U. S. Treasury Department has scheduled a payroll-savings program, or bond-selling campaign, for the petroleum industry April 18 to May 14, designed to induce oil men to stash away some of their hard-earned dough with Uncle Sam for 10 years.

It would seem that this worthy project could be presented on its own merits, but the government press agents had to cook up some gobbledegook to disguise it. Prominent oil men get invitations to attend a high-toned banquet for the purpose of discussing the "management of the national debt." Doubtless they feel flattered that the Government has asked them to contribute their financial acumen to the formulation of a sound fiscal policy, but after the meal all they get is a pep talk on buying government bonds.

Now U. S. bonds and payroll savings are good ideas, and so is management of the national debt, but the two aren't necessarily synonymous. The connection, such as there is, lies in the hypothesis that if a lot of people own small hunks of the U. S. Treasury in the form of savings bonds they will be very outspoken in cautioning their congressmen not to spend any of it foolishly. It's a beautiful theory, but it hasn't worked worth a darn to date.

If the theory worked, every oil man buying a bond would insist on an endorsement that none of the money is to be used by the Government to compete with him, or to build $9,000,000,000 worth of synthetic-fuels plants, and such like.

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CLEAN UP THE "WORKING SURFACE" OF YOUR CASING

Read these facts about the Baker Rotary Casing Scraper

Have you ever tried to run testing tools or a swab, and had the rubber packing unit or the rubber cups so badly cut, torn and mutilated that the run was a failure? The chances are that the trouble was caused by burrs from gun-shot holes or by the sheath of hardened cement or mud which remains on the inside walls of casing, even after a bit of maximum possible gauge has been used to drill out after a cement job.

Until quite recently there was no fast, simple method of overcoming these difficulties. Now, however, it is truly a waste of time, temper and money to leave any obstructions adhering to or protruding from the "working surface" of your casing. The Baker Rotary Casing Scraper quickly, positively and economically removes *all* obstruction from the inside walls of casing, leaving the surface clean and smooth—ready for *immediate* testing and completion—and in good condition for any remedial or work-over operations *one year or ten years in the future.*

STRONG, SIMPLE CONSTRUCTION

The Baker Rotary Casing Scraper consists of a strong body in which three long, reamer-type, hard-faced blades are vertically mounted. These three blades form an expandible reamer due to the fact that they are pressed outward against the inside walls of the casing by a number of coil springs. This self-equalizing feature insures constant, uniform contact with the walls of the casing, and is one of the secrets of the clean, smooth scraping action. Hard facing is applied in a flat, rectangular recess to form the long cutting edge of each blade, and a worthwhile amount of scraping can be done before the blades are dulled.

Ample circulating areas permit free disposal of cuttings; the streamlined exterior of the body insures ease in running-in; and if by accident the Casing Scraper is run out of the lower end of the casing, there is no difficulty in bringing it back inside for removal from the well.

FACTS ABOUT ITS USE

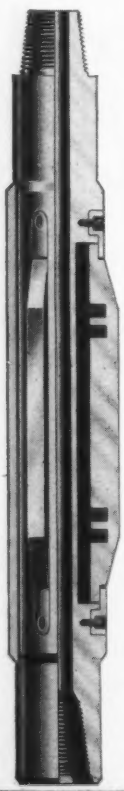
The ideal time to us a Baker Rotary Casing Scraper is while the rotary rig is still up and the crew is on hand. Install the Casing Scraper just above the bit when going in to drill out the cement shoe. Even when a bit of the maximum possible gauge is used for drilling-out, a thin, hard sheath (or skin) of cement will still remain adhering to the inside walls of the casing. The Baker Rotary Casing Scraper removes not only this hardened sheath of cement, but also scrapes away all mill scale, and smooths out rough areas. The inside of the casing is left clean and smooth, ready for trouble-free, down-hole work immediately thereafter, or at any future time.

If the well is gun perforated, then a second run of the Baker Rotary Casing Scraper will remove any burrs left around the gun-shot holes. The slight additional cost of this second run is negligible when you consider what the clean, smooth casing will mean when any future down-hole work is done.

If at a later time, after the rotary has been removed, obstructions on the inside walls of the casing interfere with operations, the Baker Rotary Casing Scraper still can be employed successfully. By running the Casing Scraper on tubing, and rotating manually with tongs, limited areas may be scraped; while several hundred feet of casing have been scraped by rotation of the tubing with an endless spinning rope, or by means of air tongs.

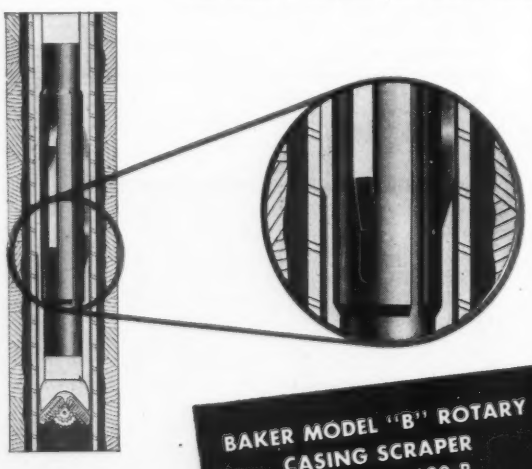
IT'S EASY TO HAVE THE "WORKING SURFACE" OF YOUR CASING IN PERFECT CONDITION

Baker Rotary Casing Scrapers are furnished on a low-cost rental basis in domestic fields, and *your* crews can run them easily and successfully to scrape the "working surface" of the casing before running casing, tubing, liners, swabs, testing tools, cement retainers, packers or other similiar tools. It pays off in savings of time, temper and money. — Why not call the nearest Baker service engineer and start enjoying these benefits in *your* wells?



(Left) With only four springs back of each blade, burrs from gun-shot holes are readily removed.

(Below) Notice the "trouble-making" sheath of cement left behind the bit and how the blades remove it.



BAKER MODEL "B" ROTARY CASING SCRAPER
Product No. 620-B

BAKER OIL TOOLS, INC. LOS ANGELES • HOUSTON • NEW YORK

THE OIL AND GAS JOURNAL

District Five

LOS ANGELES.—This area, which, with the San Francisco district, is the petroleum-supply center of what is now known officially as "District 5," is faced with the necessity of making operating adjustments following a period in which practices were dominated by the emergencies of a war and a 3-year postwar period.

While from its beginnings the West Coast has operated as regards both supply and demand largely independent of the remainder of the United States, current problems are comparable in many respects to those prevailing within the oil industry generally. In common with operators everywhere, California refiners for several months have been confronted with an excess of residual fuel, resulting in a substantial reduction in low-gravity crude-price schedules. Shifts from residual to diesel fuels, decline in export outlets, and the competition of natural gas are factors in this development.

In this connection, some operators point out that the big-inch gas line connecting to Texas source in effect replaces a demand of about 50,000 bbl. daily for fuel oil, and that happens to be roughly equivalent to the recent increases in California residual stocks. In response to greatly enlarged industrial and other demands, additional natural-gas supplies are to be brought into California, assuring the continuance of this competition with oil fuels. This is a situation common to other domestic areas where there has been a large growth in natural-gas consumption with inevitable reactions in petroleum demands, a development which has not been adequately evaluated in analyses covering future oil needs in this country.

California operators have no desire to carry the load of large residual stocks which they did for several years previous to the war. An immediate adjustment in production to conform to consumption is mandatory. The long-range solution is the expansion in processing facilities to decrease the residual yields and expand the output of the light products for which there continue to be large increases in consumption throughout this district.

In addition to the changing domestic markets, California operators have problems brought about by reduced exports. Prewar outlets in other countries of the Western Hemisphere and the Far East absorbed up to 25 per cent of their output. These demands have since shrunk to about 5 per cent.

The greater output of Venezuela, Canada, the Middle East, and the Far East has provided a competition which probably will continue to restrict this western market largely to domestic outlets. Over-all there is every indication the domestic demands for petroleum products within the district will continue to expand, with emphasis on the most valuable products. Today's problems of adjustments are no greater than have been solved many times in the past by California operators acting voluntarily and with full protection to consumers.

Krug Refuses to Say How Much Excess Crude Capacity Needed

WASHINGTON.—A number of factors which could be evaluated only at the time of emergency would determine how much more oil-producing ability is needed for military security, according to Secretary of the Interior J. A. Krug.

Those factors would include the date and duration of another war, should one occur; the area or areas in which it would be fought; the allies and the enemies which we would have; the type of equipment available and in use; and the various problems related to industrial and civilian oil usage in war.

Krug expressed his views in a letter to Sen. Tom Connally of Texas in commenting on a letter to Connally from Ernest O. Thompson of the Texas Railroad Commission asking for information as to how far the Government believes the oil industry should go in developing reserves against another war.

The secretary explained that since the Government must have available the most competent estimates as to requirements and supply of petroleum in the event of an emergency, the National Military Establishment, Department of the Interior, and their industry advisory groups, particularly the Military Petroleum Advisory Board, "have been working diligently on the problem." However, he added, these estimates carry a very high military-security classification and the figures cannot be furnished Thompson.

Termed Highly Urgent

"It can be said, however," Krug continued, "that additional domestic productive capacity is considered to be of a high order of urgency, and that present productive capacity in the United States and other accessible supply areas is not believed to be adequate, should the nation find itself engaged in a major conflict."

Krug explained that recent changes in the over-all supply situation have had a heavy impact on domestic production, including that in Texas which produces one-fourth of the world's oil. He pointed out, for instance, that in December 1949 Canadian refineries received 1,077,491 bbl. of crude from Texas whereas in the same month last year they took only 190,002 bbl. Refineries in Alberta which had been obtaining part of their crude by tank car from Texas now are being supplied from the new producing areas developed in western Canada, while refineries in the eastern part of the Dominion have shifted their sources of supply and now obtain more crude from Venezuela, Trinidad, and the Middle East.

"The dollar stringency abroad and the more plentiful supply of other currencies affect oil operations in Texas," the secretary pointed out. "For example, the action of Argentina in not permitting the use of dollar exchange to buy oil prevents the shipment of Texas crude oil to one of the American-owned refineries in that country. Other things also must be considered, such as the alteration of European refineries to enable them to operate on Middle East crudes, the expansion of existing refineries and the building of new ones in the European countries and elsewhere abroad, and, of curse, the expansion of crude-oil production capacity throughout the world. Imports of foreign oils also are involved, including the relatively small amount of crude oil received in Texas from the new producing area developed recently in northeastern Mexico. Within our own borders, the mild winter along the Eastern Seaboard resulted in a sharply lower than estimated consumption of heating oils, which had a direct bearing upon the demands for oils from Texas.

"I have listed these several items to illustrate how a wide range of events, large and small, can affect the oil situation, in Texas particularly, and other states as well," Krug said.

Texas Legislature Acts on Natural Gas Tax Bill; Other Bills Pending

AUSTIN.—Outstanding action of the Texas Legislature last week affecting the oil industry was the whittling down of one gas-tax measure, committee approval on two other oil-industry tax proposals, and the delaying for another week of committee decisions on two more industry tax bills.

The house voted by 68 to 58 a reduction in C. S. McLellan's bill calling for a production tax on natural gas of 1 cent per 1,000 cu. ft. The amendment by M. K. Thomas of Wills Point bringing the tax rate to ¾ cent was considered by McLellan as a "crippling blow." Estimated revenue from the bill was reduced from approximately $22,000,000 to about $17,000,000. The McLellan tax bill would be in addition to the tax of 5.2 per cent of market value which is now in effect.

More time to study the Davis Clifton bill which proposes to impose a processing tax of 1 cent per gallon on the manufacture of combustible fuels was granted a subcommittee. This bill has brought strong opposition from the oil industry as a serious threat to refiners of the state. Some quarters observed that the chances of this bill even being reported out of the subcommittee were remote.

The threat of this bill to the oil industry was further emphasized last week when H. W. Ferguson, director of Humble Oil & Refining Co., wrote a letter to this effect to all members of the house committee on revenue and taxation. He explained that such a processing tax "would dismember and dry up a flourishing petroleum-refining industry as well as seriously affect oil and gas production and conservation."

He said that Texas would lose 200,000 bbl. daily of crude-oil refining to other states should the bill become law.

A bill which would allow the state land commissioner to regulate geophysical and other exploration activities in tideland areas was approved by the house committee on oil and gas. The bill as proposed by Rep. O. E. Cannon, Corpus Christi, would call for the state charging $50 per day for each exploration crew.

Committee approval was given a bill by Rep. Dudley Peterson of Galveston to permit extension of state leases on tideland tracts for 5 years, upon payment of $1,000 annually, if gas has been discovered but not yet marketed during the original 25-year lease term.

Action on the Tufares bill, to impose a tax of 1 cent per 1,000 cu. ft. on natural-gas gathering, was put off for another week. A second bill delayed was that of Rep. Bill Wood of Tyler to require oil and gas leases to provide at least ⅛ royalty to the landowner, without deducting costs of production.

A resolution was approved by the house by a bare two-vote margin urging Congress to set a tariff or quota on the import of foreign crude oil. The proposal, sponsored by Rep. Marshall O. Bell of San Antonio, was sent to the senate.

A second house resolution to be approved was one asking the Texas Railroad Commission to oppose before the Federal Power Commission any future applications of companies to take natural gas from Texas.

Top and Bottom Fractions Are Discussed at Refiners Meeting

by George Weber
Refining Editor

HOUSTON.—More efficient utilization of two hydrocarbon fractions at opposite ends of the petroleum distillation curve was advocated last week at the annual meeting of the Division of Refining of the American Petroleum Institute.

Natural gasoline and "cycle gas" products whose recent production rise was termed "only the beginning" occupied prominent attention at a symposium of the problems of vapor lock. The bottom of the crude barrel, residual fuel oil currently in a similar weak market position, was submitted as the logical alternate to coal or shale oil for future conversion to the lighter distillates whose demand will eventually exceed domestic production by present methods.

Since vapor lock presently governs the percentage of natural-gas liquids which can be blended with motor gasoline, three representatives of the automotive industry were invited to discuss the vapor-lock problem with the refiners. Asked whether design changes in automobiles were possible, to afford use of higher-volatility fuels, their answer was a qualified yes. Speaking for themselves and not necessarily for the industry as a whole, they expressed sincere interest in incorporating in future cars, modifications which would allow more use of light ends.

Light Products Appraised

As to feasibility for the reasonably near future, they countered by asking refiners to determine what volatility fuel they could deliver to the service station without undue loss. With this goal to shoot at, they felt they could produce fuel systems giving trouble-free operation—in the undetermined future.

Within definite limits, some added blending of these products with motor fuel was declared possible at the present time. B. R. Carney of Warren Petroleum Corp., who represented natural-gasoline manufacturers on the symposium panel, presented the year's supply-and-demand picture for light hydrocarbons. His appraisal for 1949 showed an estimated supply of 185,100,000 bbl. of liquefied refinery gases and natural-gas liquids as contrasted to an estimated demand for 179,000,000 bbl. as L.P.G., motor fuel, refinery raw materials, and heavier products. In his estimation, an increase of ½ lb. in Reid vapor pressure, or a blend to maximum volatility specifications by refiners, would absorb the anticipated 6,100,000-bbl. excess this year.

Chester F. Smith, vice president, Standard Oil Co. (N. J.) and vice president of A.P.I. for the Refining Division, addressing the annual meeting of the group in Houston

No such simple solution was seen for the next several years, as improved conservation of casing-head gas plus expansion of cycling combine to boost production of natural and cycle products still further. Arose the factor of conservation, an underlying reason for scheduling the vapor lock forum. Texas Railroad Commissioner E. O. Thompson, the fifth member of the panel, left no room for misunderstanding that body's position. He asked both refiners and automobile manufacturers to give prior consideration to the wider use of these "fruits of conservation." Should such liquid products find insufficient demand, he stated that Texas oil production could be legally prorated to such a level as to make natural gasoline more desirable.

In his address before the open dinner session, Chester F. Smith, vice president of Standard Oil Co. (N.J.) and A.P.I. vice president for the refining division, considered a number of trends in the immediate and far future. The industry must lean heavily on technology in continuing to furnish the American public with the products it demands, he said.

Gasoline production this summer must equal or exceed last year's with an important difference—it must be done with somewhat lower crude runs due to high middle-distillate and residual-fuel-oil stocks, Smith said. For the future, he saw a continuing increase in motor-fuel octane in order to utilize the added efficiency of automobile engines which are already designed to go to higher compression ratios.

For the long term, however, he expressed belief that the greatest single problem is the potential increase in demand for middle distillates at a higher rate than that for motor fuels. The swing toward an increasing middle-distillate yield will probably resume after the temporary concern over boosting gasoline production this year. Increased conversion of residuals to lighter products is already apparent, Smith said, stating that residual yields are now 10 per cent lower than a year ago. The technological problem of continuing this trend he felt would be toughest in the small refineries.

This whole problem of improving the utilization and the value of residuals, he declared, had a definite bearing on an extremely important subject—"the current suggestions that there be an immediate start on a large-scale program for construction of synthetic plants using coal and shale. These are, of course, major potential sources of light liquid fuels. Quite probably, one or both of them will come into substantial use some time in the future."

"In my view, however," Smith continued, "there is a serious question whether the national welfare would be served by starting such a program now, either for immediate or near-future domestic petroleum requirements, or as standby capacity for potential emergency.

Resid Called Backstop

"In the first place and fundamentally, there is every evidence that for many, many years Western Hemisphere crude-oil production will continue to be adequate for any Western Hemisphere requirements. We are not running out of oil.

"But in addition, if it were necessary, there is another source of light liquid fuels—residual fuel oil—which can provide increased quantities of light products more economically and more rapidly than they can be obtained from synthetic plants. For even if the demand for petroleum products should reach the level of crude-oil availability, the refineries would be producing large quantities of residual fuel oil which could serve as a better raw material than coal or shale for an increase in the manufacture of light fuels."

As the principal speaker of the evening, Harold G. Osborn, vice president of Continental Oil Co., discussed the subject "Labor More Worthy of its Hire." He stressed the importance to

both management and labor of foremen who can express themselves understandably, and who like to help people. The proper selection and training of these key men will, he said, greatly reduce the wages and earnings lost through the reduction of grievances.

The increasing role of proper refinery maintenance was recognized in a four-paper session on that subject. Preventive maintenance, control of maintenance costs by means of business-machine records, better scheduling as a factor in decreasing maintenance costs, and the layout and tooling of maintenance shops were fully discussed by authors of the four papers. These reflected the emphasis on reducing operation costs in one of the few categories where reduction is possible in these particular times.

The program committee, headed by John W. Newton, vice president of Magnolia Petroleum Co., scheduled for the last session the subject of waste disposal. A general paper on the biological measure of stream conditions which set up yardsticks of stream pollution through analysis of aquatic life, was followed by three practical papers on solution of the waste problem in three refineries. By-product and spent chemicals and oil, the major factors in pollution, were subjects of two reports on their successful elimination from refinery effluents. The third paper also concerned the growing problem of many refiners—greater utilization of a limited water supply, by conditioning and reuse of waste water.

Railroad Commission Hearing to Be Devoted to MER, Imports, Stocks

AUSTIN.—Preparatory action by the Texas Railroad Commission for its state-wide allowable hearing April 19 indicated that this month's hearing will prove to be of exceptional interest.

Reexamination of the MER's, an accurate determination of imports expected for May and June through figures offered by various oil companies, and a study of what the working stock of crude oil should be in the United States are topics scheduled to receive considerable attention and study by the commission at its hearing in Houston at the Shamrock Hotel.

Sixteen oil companies have received the following telegram from the commission's chief supervisor of the Oil and Gas Division, Harry M. Batis:

"In addition to your own nomination of crude oil from Texas we desire and urgently request the amount of imports by your own company or affiliated companies for the months of May and June 1949."

Several companies have answered the telegram. Some stated that they did not expect to import any oil during those months and some indicated the amount they expected to import. Detailed information will be presented at the hearing by company representatives. Companies already have expressed willingness to cooperate.

"We have a surplus of oil, and we want to know how much of it is being caused by imports. It looks like Texas is the only state that is cutting production," Batis said.

To the presidents of 19 oil companies W. J. Murray, Jr., chairman of the Railroad Commission, sent a telegram requesting various companies to have representatives at the hearing to obtain their views on what the working-stock figure of crude oil should be in the United States.

The telegram is as follows: "In 1938 you will doubtless recall we made a study of maximum and minimum working stocks of crude and gasoline for the United States. The testimony at that hearing indicated that somewhere between 230,000,000 and 260,000,000 bbl. was the safe level for crude stocks. We intend to reopen this inquiry at our state-wide oil and gas hearing to be held at Houston, Tex., April 19, and urgently request your presence at this hearing so that we may have your views on proper safe working-stock levels of crude and finished and unfinished gasoline. The developments and additions to pipe lines and refineries in the last 10 years would seem to indicate the need for bringing our information up to date."

The MER figures for Texas oil fields are scheduled for a careful and critical reexamination by the commission beginning with this hearing.

No Sign of Slackening In Drilling Activity

DRILLING activity in the United States is showing no signs of slackening off, despite various rumors to the contrary. Total well completions for the first 14 weeks of this year are 667 ahead of the same period last year, according to The Oil and Gas Journal's own data. Completions to April 9 this year are 9,313 against 8,646 in the same period last year. Wildcats included in these totals show an increase of 185 over last year—1,642 this year against 1,457 last year.

Several of the rumors regarding either minor or drastic curtailments in the drilling programs of some of the larger companies have been checked by The Oil and Gas Journal, and in every case so far, have been found untrue.

The most reliable index to the next couple of months is the data on rotary rigs in operation. These data are shown in the accompanying table for the week ending April 4 this year, as compared to April 5, last year.

ROTARY RIGS IN OPERATION

	Week ended 4-4-49	Week ended 4-5-48	Change
Gulf Coast	568	521	+47
West Texas-N. M.	559	538	+21
Ark.-La.-Tex.	144	144	..
Oklahoma	274	272	+ 2
Kansas	115	135	—20
Illinois and Eastern	71	54	+17
Rocky Mtn.	96	135	—39
Pacific Coast	186	164	+22
Total U. S.	2,013	1,963	+50
Western Canada	80	42	+38

Courtesy of Hughes Tool Co.

Superior Drills Deeper Well, Sets New Record

THE company holding the distinction of having drilled the world's two deepest wells has again set a new drilling record—this time in Wyoming. Superior Oil Co. of California has successfully carried its 1 Unit, SW NE SW 27-27n-103w, a Pacific Creek wildcat in Sublette County, 23 miles east of Farson, to a depth of 18,772 ft.

This depth compares with 51-11 Weller, which was drilled to a depth of 17,823 ft. in 1947, near Fort Cobb, in Caddo County, Oklahoma.; and 1 Limoneira, near Ventura, Calif., which was abandoned last month at a depth of 18,734 ft.

New venture is a tight hole, with no geological data being released, but reports indicate the well is now in the Cretaceous. Further unconfirmed reports indicate gas shows were encountered at approximately 12,000 ft. Projected depth, also unconfirmed, is reported to be below 19,000 ft., and observers report that enough pipe is on hand to carry the well below 20,000 ft. Mesa Verde was reported topped at 8,434 ft. The well is now more than 4,000 ft. deeper than the world's deepest producer. Pure Oil Co.'s 14,309-ft. well in West Poison Spider field near Casper, Wyo.

The 1 Unit, unlike the two previous record breakers, is being drilled with a new $1,000,000 rig which was displayed at the International Petroleum Exposition in Tulsa last May, and which is termed "the world's largest rig, capable of drilling to 20,000 ft."

this week

DRILLING—Drilling activity continues at high level. . . . ¶Recurrent rumors that many large companies have curtailed their drilling programs have all proven baseless on investigation. . . . ¶Proof lies in fact that there are 50 more rotary rigs running than at same time last year. . . . ¶Superior again breaks its own world record for deep drilling. . . .

PRODUCTION—Future production rates hinge on volume of imports, desirable level of working stocks, Government's goal for excess capacity. . . . Texas Railroad Commission attempting to secure data on all three. . . . ¶Krug refuses to reveal military needs for standby crude capacity, but new NSRB report favors strong domestic industry. . . .

CONSERVATION—Texas allowables hearing next week may bring important changes in conservation rules. . . . ¶New definitions of MER for state are in the making. . . . ¶Increasing concern over underground waste may lead to tighter restrictions of use of wet gas. . . . Possibly curtailment of some pipe-line sales. . . . ¶Bureau of Internal Revenue clarifies tax status of unit operating agreements. . . .

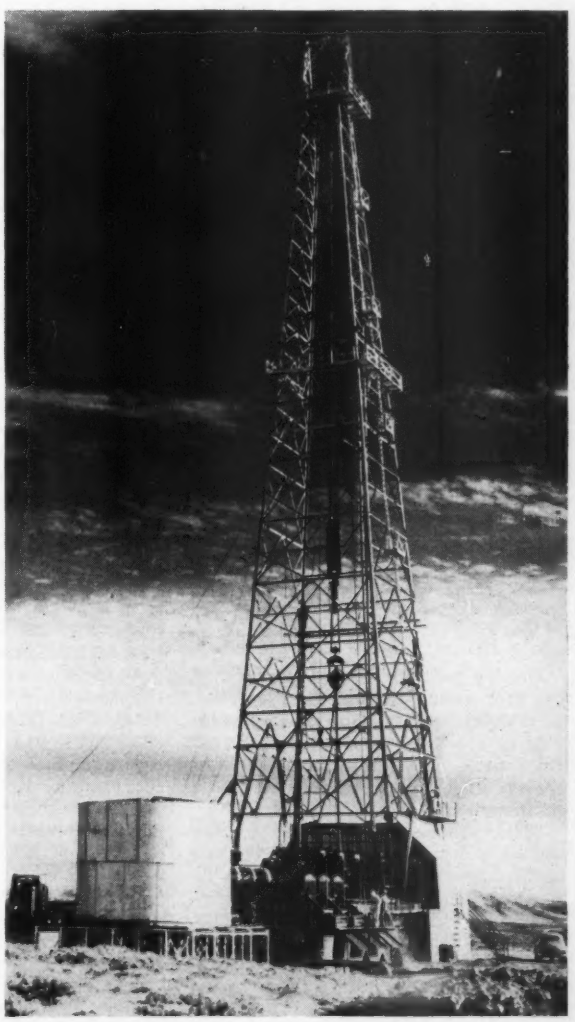
REFINING—Refiners see their greatest problems and their greatest future in new uses for their heaviest and their lightest cuts. . . . ¶Resid said to have greater potentialities as a future reserve than synthetic fuels. . . . ¶Many possibilities for greater uses and revenues from very light fractions are under intensive study. . . . ¶Improved markets for lubes said to lie with industrial users if adequately cultivated. . . .

INTERNATIONAL—Colombia's oil future is badly clouded. . . . Many firms said to be planning to abandon the country. . . . Extensive wildcatting brings only failure. . . . Government launches new survey of situation. . . . ¶Still more details revealed on Pemex contract with American group. . . . Other concerns showing more interest in Mexico. . . . ¶Trans-Arabian's deal to move Navy oil in exchange for pipe export permit still shrouded with mystery and under fire. . . . Now its plans are again upset by Syrian Government coup. . . . ¶In Europe, Russian operators make a strike in Austria. . . . And exploration is extended in Holland. . . .

NATURAL GAS—Producers bombard Congress with arguments why gas production should be removed from control by Federal Power Commission. . . . Possible hitch to legislation develops in demand that exemption be broadened to include fields produced both by independents and pipe-line companies. . . . ¶Northern Natural seeks authority to increase its capacity by 60,000,000 cu. ft. daily.

TRENDS—Daily average crude-oil production for the first full week under reduced allowables for April dropped 156,000 bbl. . . . This is the first week with production under 5,000,000 bbl. since May 1947. . . . ¶Refinery demand for four principal products in 5-week period ended April 2 was about 2.4 per cent above same period last year. . . . Percentage change by products—gasoline up 10.2, kerosine up 1.4, distillates down 1.8, and residual down 6.8. . . . ¶Crude-oil imports for March (based on A.P.I. runs and Bureau of Mines stocks) are estimated at 350,000 bbl. daily compared with 280,000 bbl. daily during March 1948. . . . ¶Gasoline market continues firm as more shipping orders are reported by suppliers. . . . Ethyl Corp. again reduces price of antiknock compound. . . . Light heating oil prices are lowered fractionally in eastern area.

New champion and the third for Superior. The world's deepest well, described on opposite page, is drilling with this world's largest diesel rig. Derrick is 189 ft. high, power is by three supercharged dual-fuel engines, crown block and traveling block are the biggest ever used



Gas Producers Ask Legislation To Clarify Natural Gas Act

by Bertram F. Linz

WASHINGTON.—Independent producers of natural gas last week asked the House interstate commerce oil subcommittee to take prompt action on legislation clarifying the Natural Gas Act with respect to Federal Power Commission jurisdiction over production and gathering.

They told the subcommittee, headed by Rep. Oren Harris of Arkansas, that they had little faith in the assurances given by the FPC, following the Supreme Court decision in the Interstate Natural Gas Co. case, that it will not assert jurisdiction over producers and gatherers who, except for contracts to sell their gas, had no affiliation with the pipe-line companies, pointing out that the commission at any time might reverse itself.

Their showing that the courts had ignored the definite intent of Congress to exempt production and gathering from federal control when the Natural Gas Act was under consideration brought from Rep. Robert Hale of Maine the comment that this appeared to be an instance where Congress is called on to correct Supreme Court interpretations of the law, as in the case of the portal-to-portal and overtime-on-overtime situations.

"A Dangerous Effect"

Declaring that public-utility control of the interstate pipe lines "must not be permitted to destroy the vitality and financial soundness of the producers of gas," B. A. Hardey of Shreveport, La., whose experience includes service as state conservation commissioner, representative on the Interstate Oil Compact Commission, and president of the Independent Petroleum Association of America, told the subcommittee the present course of the FPC is having a dangerous effect.

Hardey pointed out that the producing branch has none of the protection of a public utility "and the risks involved are so great and so different from those of a public utility that it cannot survive and be regulated as a public utility.

"The producer is willing to take the risks in exploring and developing natural gas but when he succeeds he must have the rewards that are normal to the operations of this industry if the availability of gas in ever-increasing volumes is to be continued," Hardey said. "Today the availability of gas is being curtailed because of the widespread fear among producers and gatherers of gas of being placed under public-utility regulation by the Federal Power Commission."

Hardey said that since we have the ability to find more gas than we use, it is important to the national economy that its availability to the consuming public be encouraged, but the commission's activities, he charged, are retarding availability for the consuming areas and also forcing the wasting of large quantities—more than 1,000 M.c.f. daily in Texas and Louisiana alone through flaring.

Any attempt to regulate the local activity of producing and gathering would have a most drastic deterrent effect, he said, and the fear of such control is making it difficult for Trans-Continental Pipe Line Co. to round up the contracts necessary to support its projected pipe line from Texas to New York.

Oil and Gas Intermingled

Hardey emphasized that much of the gas available is associated with oil and explained that the two are so intermingled that the regulation of one would inevitably have the effect of regulation of the other. Oil producers are unwilling to take the chance, he said, and much gas so produced, which otherwise would be marketed, is being wasted.

Hardey's views were emphasized by Hayden W. Head of Corpus Christi, Tex., attorney for Southern Minerals Corp., independent producer of both crude oil and natural gas.

Head explained that the company has a number of oil wells in Richard King field south of Corpus Christi, with a production of about 3,000 bbl. daily, together with some gas which now is flared, and has completed eight gas wells in two different sands in the same field. Tennessee Gas Transmission Co. made a good offer for the company's gas, Head said, but he recommended that it be rejected because at the time he found that FPC was rapidly expanding the scope of its jurisdiction. Wells have been kept shut in and are suffering from drainage from wells in Bentonville field, from the same reservoirs.

Head explained that Southern Minerals is primarily an oil-producing company "and if the Federal Power Commission should take jurisdiction over it and declare it to be a natural-gas company, the burden thereby imposed upon it would be so onerous that it could not afford to take the chance of selling gas to Tennessee Gas Transmission Co., particularly when it might find itself not only subjected to regulation by the Federal Power Commission, but also in the position of receiving nothing for its gas should the Federal Power Commission decide to change the contract price and establish a rate base which would take into consideration its oil production and allow nothing for its investment in gas property."

The commission has done that, he pointed out, in the cases of the Colorado Interstate Gas Co. and Cities Service Gas Co.

"It would be better for Southern Minerals Corp. to run the risk of losing all its gas to others or flaring it into the air than to risk regulation by the Federal Power Commission with the distinct possibility that it would not secure any return whatever under such regulation, and this is true of almost every independent producer and gatherer not only in Texas but in the remaining producing states as well," Head declared.

"There is no doubt but that very great economic and physical waste in the production of gas will continue until Congress amends the Natural Gas Act to exempt arm's length sales made by the producer and gatherer from the jurisdiction of the Federal Power Commission. Independent producers and gatherers must avoid above all else regulations as public utilities with little if any return on the tremendous investment they have made in the most hazardous of all business enterprises, the oil and gas business."

Contrary to Conservation

FPC control of production would be contrary to the conservation interests of the producing states, the subcommittee was told by O. C. Bailey of El Dorado, Ark., independent oil producer and chairman of the state Oil and Gas Commission.

Bailey explained that in Arkansas there are a few dry-gas fields, the bulk of the production being associated with oil, and the production of the two is so intermingled it is impossible to separate their regulation. Therefore, he said, whenever the FPC extends controls over production and gathering of gas it necessarily affects the regulation by the states of the production of oil.

"We feel that the regulation governing the local activity of production and gathering of gas are the responsibility and duty of the state regulatory bodies and that Congress should clearly define the Natural Gas Act in order that no conflict could occur between state and federal authority," he said.

(Continued on page 163)

A feature of the memorial dedication of Monsanto Chemical Co.'s new Texas City plant, was a symposium on "Gulf Coast Hydrocarbon Resources." Among the prominent figures in petroleum and science participating were, left to right: J. R. Mares, vice president, Monsanto; William J. Murray, Jr., chairman, Texas Railroad Commission; Dr. Karl T. Compton, chairman, Research and Development Board of the National Military Establishment; Paul Weaver, chief geophysicist, Gulf Oil Corp.; Dr. William V. Houston, president, Rice Institute; and Dr. Richard Gonzales, economist, Humble Oil & Refining Co.

Opening of New Styrene Plant Marked by Memorial Dedication

TEXAS CITY.—In a spirit of solemn tribute, Monsanto Chemical Co. April 8 dedicated a monument and a newly reconstructed plant to the memory of 145 employes who lost their lives in the Texas City disaster 2 years ago. The occasion marked resumption of full operation in the new styrene plant, rebuilt as promised, on the site of the wrecked wartime installation.

Petroleum and chemical industry leaders attending the simple memorial service and plant inspection, later convened in Houston for a symposium on the subject, "Gulf Coast Hydrocarbon Resources," discussed by a geologist, an engineer and an economist. As moderator of the symposium, Dr. William V. Houston, president of Rice Institute, pointed to the emphasis on the future. Paul Weaver, chief geophysicist of Gulf Oil Corp. and past president of the American Association of Petroleum Geologists, first discussed anticipated domestic reserves of petroleum and natural gas. Pointing to consistent underestimation of remaining reserves during the past, he expressed belief that present estimates are conservative and that a continuing rate of discovery plus improved methods of recovery will assure this country an adequate oil supply for years to come. Concerning the Houston area of the Gulf Coast, he predicted that coming techniques which will allow drilling to 20,000 ft. will in effect add 40 per cent to prospective oil and gas territory in that region.

William J. Murray, Texas Railroad Commission chairman, discussed the "Changing Standards of Conservation." He agreed in full with Weaver in predicting a period of several years of increasing discovery, but added, "Certainly, we are running out of oil." As irreplaceable resources, both oil and gas will some day be depleted; the important fact to consider is when. Declaring that oil and gas form the foundation for the burgeoning industrial development of the Gulf Coast, Murray called for cooperation between industry and the state in assuring that the depletion date be postponed as far as possible by application of good engineering to conservation practices.

Great Natural-Gas Bargain

Dr. Richard Gonzales, economist, Humble Oil & Refining Co., stressed the great bargain value of natural gas in discussing the "Economic Outlook for Hydrocarbon Resources in the Gulf Coast." He traced the growth in consumption of oil and gas to the present dominant position those hydrocarbons play in the domestic energy picture. Price-wise he demonstrated the effect of lower oil and gas prices on keeping fuel prices generally well under the price index of all commodities during most of the past 30 years. To emphasize the low cost of gas he showed that on the basis of heat value Texas gas last year cost an average of 5 cents per thousand cubic feet while the same B.t.u. content cost 30 cents in the form of oil and $1.25 in the form of coal. The trend toward higher gas prices is already under way, and should continue, he said.

Gonzales saw petroleum and natural gas holding the edge on coal as energy sources for the next several years. Even 20-cent gas, which is coming, constitutes a definite bargain for industrial users in the Gulf Coast area, he maintained. It was later brought out in the discussion following the prepared papers, that 28 per cent of chemicals now produced originate from petroleum and natural-gas fractions, which in turn amount to but 2 per cent of total production of such hydrocarbons.

Monsanto's dedication day was terminated with a dinner at the Shamrock Hotel where guests were addressed by William M. Rand, Monsanto's president, and Dr. Karl T. Compton, chairman of the Research and Development Board of the National Military Establishment and chairman of the board of Massachusetts Institute of Technology. President Rand reiterated the company promise that "we are going to stay in Texas City," and honored the men living and dead whose study and effort made the new and better plant possible. Host of the evening was Joseph R. Mares, vice president and general manager of Monsanto Chemical Co.

O.I.I.C. Decentralization Aimed at Individual Needs

Decentralization of field operations by the Oil Industry Information Committee, which was announced at a meeting in Tulsa following a 3-day canvass of activities, should result in the program moving ahead at a faster rate, and tend to put emphasis on individual needs of each section of the country, O.I.I.C. reported.

Under the plan, which was the original line of operations adopted at the beginning of the program, local oil men and regional associations will be asked to assume greater responsibility in adaptation of the program for their areas. Major objective of the plan is to better accommodate national activities to individual needs, and to give greater play to individual initiative in reaching the objectives of the industry public relations program.

National supervision of field staff will be changed from detailed to general supervision.

International

WORLD-WIDE OIL DEVELOPMENTS

More Firms Reported Quitting Exploratory Work in Colombia

SEVERAL other companies besides Stanolind Oil & Gas Co. are reported to be suspending exploratory operations in Colombia pending a more favorable outlook for operations in that country.

Stanolind acquired four wildcat concessions in Colombia early last year as the first venture of its newly organized foreign division. The company several weeks ago confirmed its suspension of operations "pending a more favorable industry situation."

Others reported becoming inactive in Colombia are Cia. Unidas de Petroleo (Sinclair Oil Corp., Cities Service Oil Co., and Richfield Oil Corp. through Tri-Pet. Corp.); Superior Oil Co.; and Gulf Oil Corp., which operates in Colombia through Colombian Gulf Oil Co. and Caribbean Gulf Co. None of these companies have production.

Record Discouraging

Behind the present situation lies a long record of discouraging wildcatting by various companies in Colombia. One estimate is that the industry has spent some $200,000,000 drilling dry holes and other unsuccessful exploration over the last quarter century. In addition, the companies have run into legal difficulties and labor problems.

The Shell organization, second largest producer in Colombia, in a statement reported in Bogota, said in the last 12 years it had carried out an intense exploration and development program. This cost some $80,000,000 and resulted in the discovery of two commercial fields, Casabe and Dificil, where combined production is now about 22,000 bbl. daily.

Because of the insufficient results of this program, Shell has curtailed its activities and is said to be now confronted with the problem of not having firm concessions which warrant drilling. Most of its bids are in litigation before the Supreme Court. The company considers the future uncertain, and does not know if legal, labor, or economic developments will make it necessary to reduce its activities further.

Colombia is now producing some 82,000 bbl. daily. In 1948 daily average production was about 66,700 bbl. Of this, approximately 40 per cent came from the DeMares concession which is operated by Tropical Oil Co. and was discovered in 1915. The property reverts to the government in August 1951, and a government-controlled company to take over the holdings has been authorized.

Two Major Obstacles

Two major obstacles appear to be important factors in the slowdown of exploration in Colombia. One is the difficulty of obtaining title. Private ownership of mineral rights prior to 1873 supersedes that of the government, and settlement of these claims involved prolonged litigation.

Drilling permits are not granted until the ownership question is settled. One oil-company official cited a case where title question had been in litigation more than 25 years. He said one solution would be to place the money due on the property in escrow and let the development proceed, but no such arrangement had been worked out.

The second obstacle to continued work in Colombia is the tax situation. Although royalty as based on a sliding scale from seaboard is conceded to be equitable, various other burdensome taxes, such as the patrimony levy on property, are encountered in the country. Labor problems also have proven difficult.

With more favorable results, the operating companies might be willing to continue in Colombia despite the legal and political handicaps. However, at present, the possibilities of worth-while discoveries do not appear to justify the risks. In the opinion of a veteran company executive, Colombia has often been an area where brilliant prospects have failed. He said he knew of no other country where the structure could look so good, the geology so promising, and yet drilling prove it dry.

Eighteen wildcats drilled last year in Colombia resulted in 17 dry holes and 1 gas well. The previous year 20 wildcats were drilled, 18 dry, 1 gas and 1 producer.

Foster Wheeler Corp. Will Make Colombian Oil Survey

The Colombian Ministry of Mines and Petroleum has signed a contract with Foster Wheeler Corp. to make a complete technical and economic report on the country's petroleum resources and refining needs.

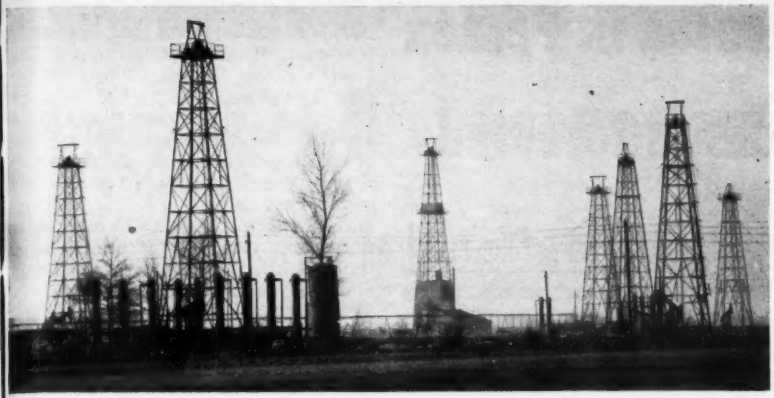
Foster Wheeler is expected shortly to set up a staff in Colombia to carry out the survey which will probably require from 6 months to a year for completion. James Mersereau, Foster Wheeler export sales official who handled the negotiations in Bogota, is expected to be in over-all charge of the project.

The survey will be concerned with transportation and marketing as well as refining. The Colombian Government's royalty oil now amounts to some 7,200 bbl. daily, and a national or government-controlled company has been authorized to take over DeMares concession when it expires in 1951. The possibility of a new refinery to handle royalty oil will be considered.

Foster Wheeler carried out a similar survey for the Bolivian Government about 6 years ago, and the company is now engaged in construction of two new Bolivian refineries.

France to End Rationing Of Motor Fuels by July 1

A recommendation that the French Government make a special distribution of gasoline to all consumers in the next 3 months and that all motor-fuel rationing be ended July 1 was voted March 30 by the National Assembly in Paris.



View of oil field near Bentheim, Emlichheim, and Darlun along the Dutch-German border

Schoonebeek Field Drilled Up, But Dutch Continue Exploration

DRILLING was temporarily suspended in Schoonebeek field in the Netherlands at the end of 1948 and rigs were moved to other locations in Holland since the potential of the field was considered sufficiently developed for the time being. Forty-one wells have been completed, and the production of 11,400 bbl. daily, reached in August 1948, was considered the maximum allowable withdrawal in view of reservoir conditions. A recent report from The Hague said that N. V. Nederlandse Aardolie Mij., the operating company, had found a sand with oil content at Dalen, about 1½ miles from Schoonebeek. The sand was found at a depth of about 2,840 ft., and further drilling is planned.

This report placed Schoonebeek production at 495,539 tons last year (about 9,400 bbl. daily) against 212,693 tons (about 4,050 bbl. daily) in 1947. The operating company is an affiliate of Standard Oil Co. (N.J.) and Bataafsche Petroleum Mij. (Shell).

A deep exploratory well was completed by the company last year on the highest part of the east-west uplift on which Schoonebeek field is located, it was reported in a summary dealing with developments in the Netherlands, prepared for the American Institute of Mining and Metallurgical Engineers. This well was 2 miles west of Coevorden and was drilled to 9,137 ft. It found high-pressure gas in fractured Permian limestone. Further development is awaiting heavy drilling equipment.

Construction Progressing On Kirkuk-Tripoli Line

Construction is continuing on Iraq Petroleum Co., Ltd.'s, new 16-in. Kirkuk-Tripoli crude lines, and the project is expected to be completed as far as Homs, Syria, by late summer.

This will allow some oil to be moved through the line, using excess capacity from Homs to Tripoli. The new line parallels the existing 12-in., and the new modern pumping equipment being installed will replace the old facilities. Centrifugal pumps are being used from Kirkuk to the Euphrates River, and reciprocating pumps west of the Euphrates. I.P.C.'s other new 16-in. line from Kirkuk to Haifa was completed to the Palestine border, and further work awaits settlement of political conditions.

Output of Synthetic Oil, Rubber Banned in Germany

Synthetic production of rubber, oil, and motor fuel will be prohibited in Germany under the French-British-United States reparations agreement reached recently in London, according to reports from Berlin.

Plants of this type were originally prohibited under a four-power agreement in 1946 but this was later modified to allow production as a temporary relief to the German economy. The new agreement has to be ratified by the three governments. It was said the plants probably would be destroyed since no other use could be found for the equipment. In the bizonal area there are 11 hydrogenation and Fischer-Tropsch plants, 5 of which were damaged or partially destroyed during the war.

International
WORLD-WIDE OIL DEVELOPMENTS

Russians Said to Have Found Oil in Austria

NEW oil production of probable importance for the future has been found in eastern Austria as a result of drilling by the Russians on a structure defined prior to the war.

The structure is at Matzen, about 20 miles northeast of Vienna in the central part of the Vienna Basin. In mid-March, Austrian sources in Vienna reported the Soviet Mineral Oil Administration had brought in a well at Matzen capable of producing 200 tons (about 1,400 bbl. daily). The well apparently is the third drilled on the structure by the Russians. Two earlier tests ran into difficulties.

The first well drilled by the Russians in 1947 yielded significant shows of oil before it was junked. A second well nearby in May of last year found gas under high pressure, but, with adequate controls lacking, the well blew out and cratered sufficiently deep to bury the derrick.

The Matzen operations last year were among the five exploratory wells drilled last year by the Russians in eastern zone of Austria over which they hold control. While non-Soviet interests were prevented from drilling by an almost complete lack of equipment, the Russians imported some five modern rigs and auxiliary material. A large part of this equipment was reported to have been of American design and may have been manufactured to American standards earlier in Germany or received by Russia under lend-lease during the war. Late in 1948 the Russians began to receive casing for their operations from Czechoslovakia.

The Matzen structure was mapped in 1937-38 by Rohoelgewinnings, A.G. (Socony-Vacuum and Shell) in core-drilling and geophysical work. This company last year resumed exploration in upper Austria with geological and core-hole investigations in the Alpine foreland east of Salzburg. The Austrian Geological Institute is carrying out this work under contract, and no concession has been granted.

Petroleum production in Austria last year averaged about 16,600 bbl. daily, according to a report made recently at the annual meeting of the American Institute of Mining and Metallurgical Engineers. Few locations are left in proved areas in Austria except at Muhlberg where output increased last year to compensate for declines elsewhere. Six new wells were completed last year at Muhlberg, but its prospects are being damaged by the Russian practice of flowing the wells at a high rate.

More Details Revealed in Pemex Deal; Other Firms Interested

WASHINGTON.—At least four oil organizations, apparently independent, have evinced interest in making contracts to exploit Mexican oil resources similar to that entered into between American Independent Oil Co. (Mexico) and Petroleos Mexicanos, it was disclosed this week.

Senator Antonio J. Bermudez, director general of Pemex, is conducting negotiations with the four companies, personally and by mail, but has disclosed neither the identity of the parties interested nor details of the projected arrangements.

The discussions of additional agreements have served to bring out more details of the contracts entered into by American Independent. One feature of those contracts is that while the company will pay no income or other taxes in Mexico it will nevertheless be subject to such taxes, but they will be paid by Pemex out of company income and Pemex then will pay the company an equal amount as additional income. As a result, it is believed that the Mexican income tax will be applicable against the company's United States income tax as a credit, and in addition thereto it may write off all of its intangible drilling costs and take its depreciation and depletion allowances.

Good Production Returns

With its allowance for compensation for costs and its reimbursement for effort, American Independent will receive from 65 to 68¼ per cent of the gross production of the wells it brings in. Considering the tax savings and freedom from operation, transportation, and storage costs, and also the fact that no initial lease or acquisition costs need be amortized, the deal is figured as comparing favorably with the rate of return from normal operations in the United States.

American Independent was formed this month by the negotiators of the contract, Ralph K. Davies, president of American Independent Oil Co.; Edwin W. Pauley, Los Angeles independent producer; and Samuel B. Mosher, president of Signal Oil & Gas Co., as a wholly owned subsidiary of Davies' company with an initial capitalization of approximately $1,000,000.

Just how much it is estimated will be required to undertake the project has not been disclosed, but it is said that, depending upon the rapidity with which discoveries can be made and oil produced, there should come a time not too long after the start of the producing period when the company will be operating on income, thus limiting the amount of development capital required.

The area in the Isthmus of Tehuantepec and the western Tabasco region in which the company will operate is explained as a salt-dome area structurally and stratigraphically similar to South Louisiana and eastern Coastal Texas, while central Tabasco is a structurally high region which separates the basin on the west from a basin on the east. The entire area is prospective oil territory, and the Isthmus has been producing for the past 40 years.

Data to Be Advantageous

The company will have the advantage of information representing millions of dollars in exploratory costs, representing the results of some $500,000 of exploratory work by Signal Oil & Gas along the coast during the past few years which has located a number of salt domes in the offshore area and in the lagoons, and the work done by Pemex, starting with data accumulated by the Shell Oil Co., Inc., and augmented by geophysical explorations conducted by United States firms, including Geophysical Service, Inc., and Westby Geophysical Co.

The area generally does not appear to contain any unusual operational difficulties, according to members of the group. The Port of Mexico, located at the mouth of the Coatzacoalcos River, is the logical operational headquarters for the offshore geophysical work. The coastal sea floor dips very gently and similar to the Texas coast, and drilling is practical for from 3 to 5 miles offshore. In all, it is said, the offshore operations, both in the geophysical work and in the drilling, should be comparable to what is now taking place along the coast of Texas and Louisiana.

The structural areas in the uplands are usually on high ground, above the swamp conditions common to the area as a whole; they are intensely cultivated, are locally accessible through farm roads and regionally accessible through an intermaze of navigable rivers. Shell Oil Co., and later Pemex, have operated without extreme difficulties for the past several years, and with the use of cargo aircraft operations should approach normal accessibility.

Looking toward the disposition of output, the company anticipates its products initially will go to the East Coast of the United States, to foreign countries, or possibly to a refinery at Minatitlan on the Coatzacoalcos River, pending construction of a pipe line planned by Pemex across the Isthmus. Following the completion of that line, the company will be in a position to market on the Pacific Coast to fill requirements that it anticipates cannot be met by new production in California.

The company has the right to take its percentages in oil and gas and to purchase Pemex's share, all delivered free of charge at a coastal landing facility near the field from which it is produced. Settlement for the oil will be based on the average gross price for similar crude, and the price for gas and other hydrocarbons will be agreed upon at the time production is obtained.

CORFO Drilling Activities Progressing as Scheduled

Reports from Punta Arenas indicate that exploration and drilling activities of CORFO (Corporacion de Fomento) in Tierra del Fuego, Chile, are progressing according to schedule. The company's 19 Manantiales is drilling at 6,120 ft. and 20 Manantiales is drilling at 5,500 ft. A wildcat test which is supposed to provide important information on the area's oil possibilities, 2 Espora, has been spudded. Reports show that geophysical work is proceeding according to schedule, and without interruption, and a seismograph crew of United Geophysical Co., Inc., is now active in the Estancia Nueva area. A government gravimeter crew is doing work in Bahia Felipe, and another seismograph crew is exploring the San Sebastian area.

In addition to making drilling headway, reports show that the highway paralleling the projected pipe line from Cerro Manantiales to the channel of the Strait of Magellan has been completed. Storage facilities are now being installed at both ends of this projected line, at Cerro Manantiales and the terminal at Caleta Clarencia.

Palembang, Sumatra, Plant Damaged by Explosion, Fire

An explosion followed by a fire April 7 damaged the Palembang, Sumatra, refinery of Standard-Vacuum Petroleum Mij.

Company officials at Palembang estimated that production at the refinery will be reduced about half for 2 weeks while repairs are made. The explosion occurred where oil vapors had accumulated following a power failure, according to reports from Palembang. Three men were reported seriously injured.

Navy Deal With Trans-Arabian Again Subject of Controversy

WASHINGTON. — Whether the agreement of the Trans-Arabian Pipe Line Co. to carry crude for the Navy through its line at actual cost for a period of 10 years was offered to induce the Commerce Department to resume the licensing of pipe exports was a subject of controversy in Washington this week.

Correspondence released by Sen. Kenneth S. Wherry of Nebraska, chairman of the Senate small business committee which folded up January 31, disclosed that the Navy disclaimed any responsibility for the agreement, which Commerce Secretary Charles Sawyer said in February he had suggested.

The existence of an "option" was made known by Sawyer February 24, when he announced approval of a permit for the export of 25,000 tons of 30-in. steel pipe for the first quarter of the year.

"Certain Rights of Transit"

In a letter to Wherry, Undersecretary of the Navy W. John Kenney declared that because of the large quantities of oil purchased by the National Military Establishment from Middle East sources, it "felt it should have certain rights of transit through the pipe line, as and when it is completed.

"However," Kenney added, "the obtaining of the option granted in the letter of 18 February 1949 was, certainly insofar as the National Military Establishment was concerned, not made a condition to the issuance of the export license."

The February 18 letter to which Kenney referred was addressed to him by Albert L. Reeves, Jr., of Cummings, Stanley, Truit & Cross, attorneys for Arabian American Oil Co. and Trans-Arabian Pipe Line Co., and referred to a letter previously sent to Sawyer by Max O'Rell Truitt as counsel for Trans-Arabian.

"As indicated in that letter," Reeves wrote, "a serious situation confronts Arabian American Oil Co. and Trans-Arabian Pipe Line Co. with respect to the trans-Arabian pipe-line construction project because of the failure of the United States to issue licenses for the export of pipe now stockpiled at Long Beach and pipe in process of fabrication."

Reeves then outlined the option which the companies were prepared to grant the military establishment, and in a final paragraph made it clear that "the granting of the foregoing option is necessarily contingent upon Trans-Arabian Pipe Line Co. being able to export from the United States the requisite pipe and materials to complete the pipe line.

"Accordingly," he emphasized, "the company reserves the right to revoke the option prior to completion of the pipe line upon 90 days' written notice to the Secretary of Defense if that company is unable to secure within the period of such notice the requisite export licenses to enable it to proceed with the construction of the pipe line at a reasonable and economical rate of construction."

Under the option, for a period of 10 years commencing with the first calendar quarter following completion of the pipe line from terminus to terminus the companies will transport for the departments of the military establishment, at a rate per barrel representing the total per barrel cost (including, but not limited to, depreciation at the rate of 8⅓ per cent per year and interest on borrowed funds) of transportation in the quarter in which delivery is made, up to 5 per cent (1,350,000 bbl. per quarter) of the now-contemplated initial capacity of the pipe line. The cost of transportation would be computed on the line's contemplated capacity of 27,000,000 bbl. per quarter, and the cost of throughput represented by any capacity in excess of that figure is not to be taken into consideration in computing the rate to the military.

Reasons for Resumption

In another letter received by Wherry, Sawyer made no comment upon the option, but said the resumption of exports was permitted on the basis of a staff review of the steel situation, world outlook for tanker transportation, and prospects of pipe production in the United States.

"In connection with the tanker survey," he commented, "we concluded that the outlook was not critical as had been generally believed."

At a news conference at which he announced the granting of the export permit, Sawyer said the study showed that despite sharp increases in steel production in the United States, line pipe is still in seriously short supply in this country, and it was a combination of that shortage and the military requirements for oil in the Mediterranean that led to his suggestion last November that, when completed, the line should carry oil purchased by the Government at actual cost of transportation. That agreement, he estimated, would save the Government more than $2,000,000 a year over the 10-year period.

International
WORLD-WIDE OIL DEVELOPMENTS

Trans-Arabian Transit Agreement Is in Doubt

THE status of Trans-Arabian Pipe Line Co.'s transit agreement with Syria was again thrown in doubt by the bloodless coup in which the army took over the government.

Trans-Arabian has been seeking to conclude a right-of-way agreement for its 1,067-mile Persian Gulf-Mediterranean pipe line since early last year. An agreement was understood to be at the point of parliamentary approval just before the military seized power.

It appeared that, at best, the change in government will mean a delay in approval of the transit rights. Officials in New York believe that it may take several weeks before the attitude of the new government is made clear.

The Syrian coup was the latest of a succession of political obstacles which the Tapline project has encountered. The first proposed agreement with Syria was held up last summer by the Syrian Government because of feeling against the United States resulting from the Palestine war.

Export licenses for steel for the line were resumed only a few weeks ago. More than 200 miles of the line have been built on the Saudi Arabian end. The route is across Saudi Arabia and Transjordan, around Palestine, and through Syria and Lebanon to Sidon on the Lebanese Coast. Right-of-way agreements have been negotiated with all the other countries.

The previous Syrian Government in addition was negotiating with other oil-company representatives regarding right-of-way for the Middle East Pipe Line, Ltd., project which is to connect the Iranian fields with the Mediterranean. Also reported awaiting approval was a concession in the southern part of the country to James W. Menhall, Benton, Ill., drilling contractor and oil producer.

Trinidad Grants Duty-Free Venezuelan Oil Imports

Trinidad Leaseholds, Ltd., has received a 25-year concession from the Trinidad Government for the duty-free importation of Venezuelan crude oil for refining.

The company previously held a 10-year concession for a limited quantity of Venezuelan crude, and the 25-year extension allows quantities limited only by the company's refinery capacity.

Secondary-Recovery Technique Highlight of Texas Conference

by D. H. Stormont

COLLEGE STATION, Tex.—Mechanisms involved in the processes of water flooding and gas injection—along with flood patterns, core studies, reservoir characteristics, and other factors involved in secondary-recovery operations—received a thorough workout here at A. & M. College April 6-8. The occasion was a petroleum-recovery conference, sponsored by the Texas Petroleum Research Committee, in which water-flooding operations took the lead. In attendance were some 300 oil-industry representatives and A. & M. engineering students.

In all, 16 papers were presented. Mainly they dealt with secondary-recovery methods and current research directed toward improving recovery techniques. Case histories of several water-flooding, gas-repressuring, and pressure-maintenance operations were presented. Also, those in attendance were told of oil-recovery research at Pennsylvania State College, and of progress of a similar Texas organization under the leadership of the Texas Petroleum Research Committee.

Texas Has Large Reserve

Just what secondary recovery means to the Texas petroleum industry was brought out by Paul D. Torrey, of Lynes, Inc., Houston, and program chairman for the conference. Estimating Texas' partial secondary-oil reserve at about 3,377 million barrels, he said that this volume represented almost 30 per cent of the state's proven primary reserve. He then went on to point out that a gross revenue of 8 billion dollars would result from the production of this secondary oil reserve, and that the people and government of Texas would benefit by the amount of some 3 billion dollars. It should be appreciated that the application of secondary-recovery methods is limited, however, just as primary production is limited, by the ability to produce oil at a profit, he added.

"Profitable applications of the most efficient methods for producing oil many times will require the unitization of the field, and, of even greater importance, freedom from liability for violation of antitrust laws after a unit or cooperative plan of operation has been adopted. The laws of Texas, which control the pooling or unitization of land for the production of oil and gas, particularly with reference to university and public-school lands, are definitely antiquated and obsolete. They should be revised in the interest both of the schools and of the oil industry."

In discussing the possibilties of secondary recovery for the United States as a whole, Torrey concluded that most authorities believe the United States should have at least 1,000,000 bbl. of potential daily oil production available for defense purposes. "The writer believes that conclusive evidence can be produced to show that the reserve potential can be obtained more easily and with greater certainty by the restoration of pressure in fields where natural energy has been dissipated, and by the maintenance of pressure in fields where only a small part of the original oil content has been removed, than by any other means."

He also believed "that a great part of this known oil reserve can be produced more economically, and with much more practical benefit to the people of the United States, than the immediately foreseeable production of substitute synthetic liquid fuels from waste agricultural products or from coal."

In a second paper, "A Review of Secondary Recovery in the United States," presented in the concluding session, Torrey said that partial secondary-oil reserves of the U. S. have been estimated to be in excess of 7 billion barrels. He added, however, that if known secondary-recovery methods are applied to this reserve, it is possible that the oil physically recoverable will amount to twice this figure.

Wants Cooperative Projects

The attitude of the Railroad Commission toward secondary-recovery operations was brought out by its chairman, W. J. Murray, in his address, "The Railroad Commission's Function in Increasing Oil Recovery." He pleaded for cooperative projects undertaken voluntarily by the oil companies rather than by coercive action on the part of the commission. In his opinion the commission is empowered by existing statutes to bring about more efficient production methods in fields where "it is known beyond a reasonable shadow of doubt that oil is being wasted which could be recovered by known techniques." He cited the court decisions in the recent Heyser and Flour Bluff suits, in which the commission's power to prevent gas flaring was upheld, as evidence the court felt that was the commission's duty.

One outstanding example of cooperative effort among oil producers in the field and the Railroad Commission was presented by W. S. Morris, vice president of East Texas Salt Water Disposal Co., Kilgore, that of returning salt water to the Woodbine producing sand in East Texas field. This project, he said, has resulted in increasing the recoverable oil reserve by an estimated 600,000,000 bbl. or more. In addition to raising ultimate recovery, Morris pointed out how the project had resulted in (1) the elimination of salt-water pollution and contamination of fresh-water streams; and (2) through the maintenance of bottom-hole pressures the use of artificial-lift equipment has been greatly reduced.

Morris reviewed subsurface disposal activities and the formation of the cooperative company. By use of slides, typical disposal plants and injection facilities were shown. In discussing these facilities he stated that at the first of this year the company had an investment of about $4,000,000 in gathering and disposal lines, treating plants, and auxiliary equipment. At that time there were 44 injection wells in operation, receiving some 520,000 bbl. of salt water daily or about 90 per cent of that produced.

Case Histories Cited

Case histories of several water floods under way in Texas were described by Paul Dean, of Great Expectations Oil Co., Fort Worth, and H. K. Holland, Jr., of Magnolia Petroleum Co., Electra. In his paper, of which David Dean was coauthor, Paul Dean discussed floods his company had under way or had completed in West Central and North Texas. Holland described the water flood under way in the West Burkburnett field of North Texas, emphasizing the necessity for obtaining data on geology, production history, reservoir properties, and other accurate data before undertaking the flood. He also discussed the water-distributing system for the field and the use of protective coating for preventing corrosion.

In "Significant Research Project in Petroleum Recovery—Present and Future," Dr. H. H. Power, chairman of the petroleum-engineering department of the University of Texas, outlined research under way in the fields of secondary recovery, drilling and development, core analysis, and others. In his address, "Results of Oil Recovery Research at Pennsylvania State College," Dr. A. W. Gauger, director of the Mineral Industries Experiment Station at Penn State, brought out how the close cooperation between the Pennsylvania oil industry and this research group

(Continued on page 163)

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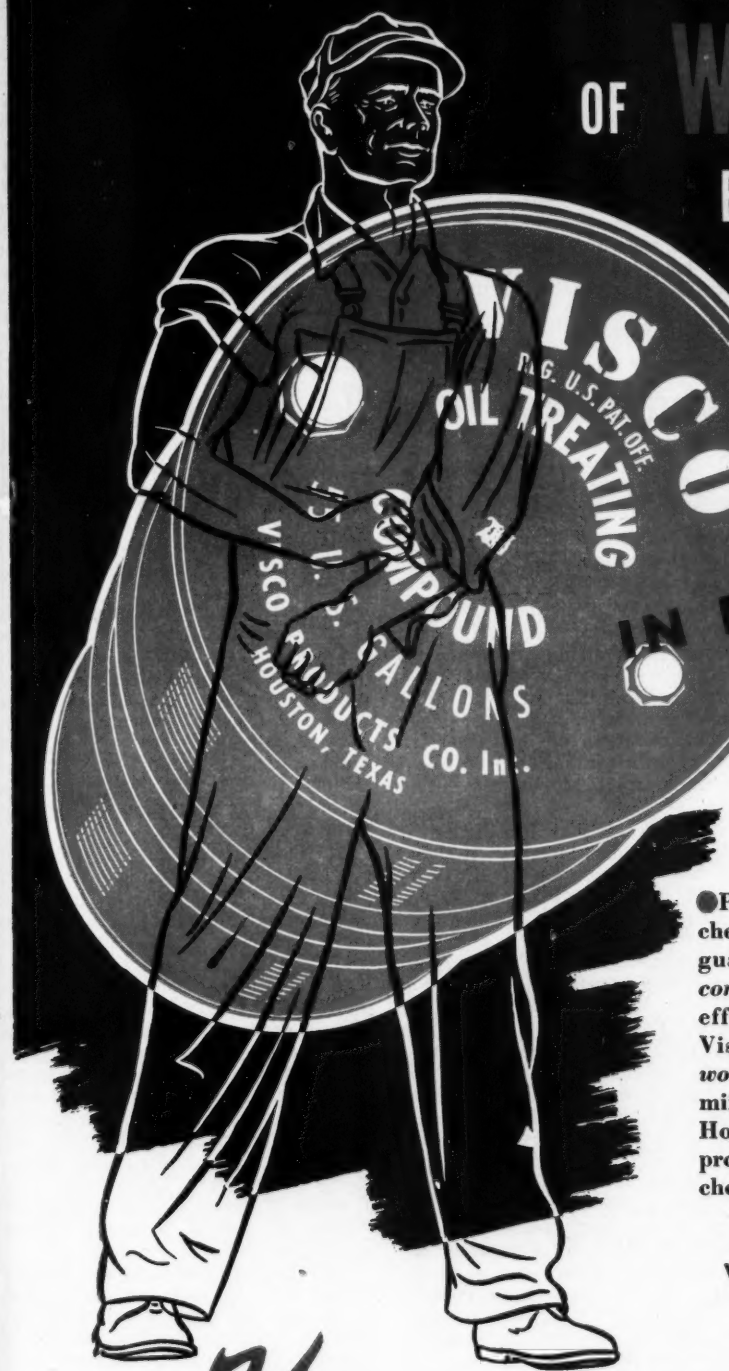

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NSRB Policy Favors Strong U.S. Industry; Dodges Import Stand

WASHINGTON.—A complete report on national oil policy has been prepared by the National Security Resources Board and, after review, will find its way to the White House with a recommendation that Congress be asked to enact any legislation necessary to make it effective.

The latest version of oil policy, prepared in consulation with representatives of the military and other departments having an interest in oil, follows generally the lines of the many other "policies" which have been drafted over a period of years but never formally adopted.

In some fields the board reportedly is vague as to what should be done, largely because of the probability that the conditions on which recommendations would be based at the present time will change in the future.

Thus, it is said to have hedged on the question of imports, expressing the view that no special legislation or import-control authority is necessary because the situation is so flexible that any plan adopted now might be obsolete in a matter of months.

NSRB representatives, who until recently believed the security of the United States could best be served by depending as far as possible on imported oil and saving our own resources for an emergency, are understood to have come out in favor of import controls to encourage the domestic industry to discover and develop more reserves, but other agencies opposed the idea and succeeded in keeping it out of the draft.

Synthetics Played Down

The new policy expresses confidence in the ability of the oil industry to meet all needs provided it is kept strong and free, and calls for development of synthetic fuels by the Government on an exploratory basis only, with a few commercial-size plants to demonstrate the feasibility of synthetic production.

Touching on other domestic problems, the report assertedly calls on the Government to work out definite policies for the public lands, including submerged areas, to encourage their maximum development without impediments to the oil industry.

Although defense representatives sought to have a definite plan of oil-industry mobilization worked into the report, it is understood that other agencies felt the subject was one for continuous study rather than "freezing," and its recommendations are understood to call only for completion of mobilization studies by the Government in cooperation with the industry.

In the foreign field, the policy supports American operations abroad but defines the areas to which it believes maximum attention should be paid, on the basis of their relative accessibility and defensibility in the event of war, rather than the volume of product they might be expected to supply under normal conditions.

Thus, it is understood, the proposals call for priorities on production and refining materials by areas in the following order: North America (U. S., Canada, and Mexico), Latin America, East Indies and Africa, Middle East, and all other.

The proposed policy reportedly recommends that as much refining capacity as possible should be built in the United States, and assistance and materials given foreign countries, particularly in Europe, only to the extent necessary to take care of their domestic requirements, but not enough for them to become unduly important factors in the world markets or to provide too many facilities which could readily be seized by an aggressor.

Management Must Be Shown Uses of Lubricants, A.S.L.E. Members Told

NEW YORK.—The oil industry is plowing back large sums in research to make improved lubricants, and the lubrication engineers must show American management how to buy and use these new keys to mass production, Granville M. Read, chief engineer, E. I. du Pont de Nemours & Co., told members of the American Society of Lubrication Engineers April 12 at their fourth annual convention in New York.

Read declared that lubrication is an inconspicuous "mighty midget" which has become one of the keystones of modern civilization. Proper lubrication can be used to improve still further our standard of living by increasing the output of farms and factories while decreasing production costs.

The du Pont official, speaking on "What Lubrication Means to Management," discussed lubrication problems from the standpoint of the consuming industry. The du Pont company, which makes more than 5,000 products ranging from petroleum chemicals and additives to synthetic fibers, from paints to explosives, from plastics to fine perfume, spends approximately $2,000,000 a year on lubrication in its plants.

In the du Pont engineering department, he said, the field of the lubrication engineer divides itself along the following lines:

1. Machines and equipment must be designed for adequate lubrication and for the proper application of lubricants.

2. The proper lubricants must be purchased and suitable inventories maintained where needed.

3. The correct lubricant must be delivered at the proper time and in proper quantity to the particular spot at each machine throughout the manufacturing areas.

Of particular importance, he said, is the relationship of the lubricating engineer to the purchasing department of the company. The lubrication engineer must evaluate lubricants necessary for each machine, consolidate requirements to a minimum number of grades and kinds, and establish a guide for the purchasing agent to assure that purchases conform to requirements.

He emphasized the necessity of planning and scheduling lubrication procedures. This, he said, not only increases production but also reduces lubrication costs at least 10 to 15 per cent.

"For example, in one of our plants there are 2,750 machines, including pumps, dryers, ball mills, kilns, and many other pieces of chemical-process equipment," Read said. "To lubricate them required more than 1,500,000 inspections a year. After we inaugurated lubrication scheduling we were able to cut the number of inspections to about 1,200,000—a drop of about 20 per cent. This resulted in savings of several thousand dollars in application costs."

More than 20 other papers, dealing mainly with the use and application of lubricants to various industries, including mining, textiles, railroads, machine tools, and steel, were presented during the 3-day program.

Charles L. Pope, lubrication engineer, Eastman Kodak Co., Rochester, N. Y., was chosen new president of the society succeeding G. L. Sumner, Westinghouse Electric Corp., East Pittsburgh, Pa. Burgess H. Jennings, Technological Institute, Northwestern University, Evanston, Ill., was reelected vice president.

Tax Status of Unit Agreements Clarified by New BIR Ruling

WASHINGTON.—A new ruling on the tax status of joint operating agreements has been issued by the Bureau of Internal Revenue to clarify three points in a definition issued last year *(The Oil and Gas Journal, December 9, 1948, page 46)* covering the types of unit agreements that will be subject to taxation as corporations effective with the first day of the taxable year of a taxpayer beginning on or after July 1, 1949.

The new decision, signed by Commissioner George J. Schoeneman March 30, deals with cases (1) where an operator or some other person is given a contractural right or option, by either a joint operating agreement or separate contract, to purchase some or all of the oil or gas; (2) where there are outstanding contracts for disposition of oir or gas extending beyond the effective date of the original ruling; and (3) contracts entered into by an agent authorized to act only for the time being, for the sale of oil or gas for periods of time regarded by the industry as minimum commitments under the circumstances.

Outlining the factors which determine whether participants in unit agreements are operating as corporations or qualified partnerships as set forth in the original ruling (I. T. 3930), the new definition explained that organizations created by such agreements are considered corporations if some person is irrevocably authorized to act in a representative capacity for a fixed or determinable period of time to sell the production from the joint operation for the joint account of two or more of the coowners.

Test Is Defined

"Thus," it was held, "the test of an association in such cases is therefore essentially organizational, depending upon the existence of collective irrevocable representative capacity which, arising from the irrevocable vesting of authority in one representative (including cases where such representative capacity is vested jointly in more than one person) to market the oil and gas produced from the jointly operated properties for two or more coowners, marks an organization with a joint profit objective.

"Association status turns upon the existence of such collective irrevocable representative capacity. Consequently, where such capacity exists, classification as an association under the Internal Revenue Code may be avoided only if such capacity is withdrawn prior to the first day of the taxable year of a taxpayer beginning on or after July 1, 1949, the effective date of I. T. 3930. Moreover, where such withdrawal is timely, no modification of sale or option contracts entered into prior to such effective date is necessary."

The ruling held that a coowner who reserves the right to take his share of the production in kind, or to direct its sale, may contract to sell or grant options to purchase his share as he sees fit without creating an association taxable as a corporation for federal income-tax purposes, and representative capacity under I. T. 3930 is not involved in such a case. Also, the fact that some or all of the coowners execute identical contracts, or the same instrument, with the same purchaser or optionee, each thereby contracting to sell all or any fractional part of his own share, or to grant options to buy any fractional part of such share, will not be held as achieving a different tax consequence since obviously no representative capacity is involved, each owner in sush a case exercising his own business discretion.

Coowners May Act

"It seems equally clear," the ruling continued, "that one coowner may authorize a person or persons (so long as that person or persons is not another coowner who is also selling his share of the production) to sell his individual share of the production, or to grant options as respects such share, without creating an association taxable as a corporation. Such representative capacity, even though irrevocable, (1) does not involve an authorization to act jointly for more than one coowner, (2) does not indicate a joint profit objective, and (3) is deemed the equivalent of a personal exercise of his own business discretion by the one coowner. However, under I. T. 3930, the same representative or representatives may not act for more than one of the coowners (including himself) without creating an association taxable as a corporation as respects the coowners so represented, unless such authorization is for the time being only (i.e., revocable at will), because, in such a case, collective irrevocable representative capacity indicative to an organization with a joint profit objective would be present.

"There remains for clarification the limitations inherent in the distinction drawn in I. T. 3930 between revocable representative capacity (authority to act for more than one coowner for the time being) and collective irrevocable representative capacity (the authority to act for more than one coowner including himself). As an association, like a formal corporation, may be organized for a short time as well as a long period of time, revocable representative capacity must be terminable at will to avoid the formation of an association with a joint profit objective. However, an agent may find it desirable or necessary to enter into sale or option contracts for an extended period of time rather than to market production on a day-to-day basis. For instance, to state an extreme example, in cases of certain cycling operations, it is necessary to contract for production for a minimum period of 1 year. Accordingly, discretionary authority terminable at will granted to a person or persons representing two or more coowners to enter into contracts committing the principals for such reasonable period of time as are consistent with the minimum needs of the industry under the circumstances but not to exceed 1 year, will not be regarded as inconsistent with revocable representative capacity in the sense that term is used herein and in I. T. 3930. Of course, as pointed out above, the coowners acting for themselves as principals may enter into such contracts for indefinite periods, as such action does not involve collective irrevocable representative capacity."

Senate Sharply Divided On New Tidelands Bill

WASHINGTON. — Thirty senators joined last week in sponsoring legislation to restore to the states title to their tidelands, and Sen. Charles W. Tobey of New Hampshire immediately announced that he and others would fight to the finish to defeat it "in the interest of all the people of the United States."

The bill, identical with that passed by the House in the last Congress but tied up in the Senate judiciary committee by Sen. Forrest C. Donnell of Missouri so long that action was impossible before adjournment, was introduced by Sen. Pat McCarran of Nevada for himself and 29 other senators.

Military Oil Requirements Will Drop 13,623,000 Bbl.

WASHINGTON. — Military oil requirements during the coming fiscal year will run more than 1,000,000 bbl. a month less than they did for the current year.

The Armed Services Petroleum Purchasing Agency is preparing to call for bids for its requirements during the 1950 fiscal year. Officials estimate that total requirements will be 79,458,000 bbl., a drop of 13,623,000 bbl. under commitments for this year.

WASHINGTON WATCHING

BY BERTRAM F. LINZ

How Much ERP?

WASHINGTON.—Senate debate on continuation of the European Recovery Program has repeatedly touched upon a problem which for some time has been a matter of concern in the State Department, Economic Cooperation Administration, and some areas of the oil industry—the increased competition in world markets which the revived British, French, and other Western European industries will offer to American exporters.

The British oil industry has made substantial progress since the inception of the Marshall plan, and France and the Netherlands also have ambitious plans for greater participation in the world oil trade. Meanwhile, lack of dollar exchange has tended to work the American oil companies out of some important markets, notably Sweden and Argentina, and there are other areas also where currencies are "soft" and work to our disadvantage.

The big question is just how far Europe, and particularly England, will go in seeking new outlets and, if they go so far as to endanger the American oil companies operating abroad, what can be done about it.

It is understood the matter already has been put up to the British, and the results that might follow an effort to obtain an undue share of world markets presented in plain terms.

It is generally expected that the British industry will continue to expand its operations, probing for soft spots and testing to see how far it can go before the United States calls a halt.

It is not believed that the British will try to go beyond any line we draw, but the whole question is a very difficult one and every effort will be made to deal with it in such a way as to protect the interest of the American oil industry without disturbing the friendly relations between the two countries.

Promoting Imports

WITH shortages of materials rapidly becoming a thing of the past, the Department of Commerce, which for years has been devoting itself to the control of exports, is gradually speeding up a program of trade promotion.

This was the major activity of the old Bureau of Foreign and Domestic Commerce before the war, but whereas it then was aimed primarily at increasing our foreign markets the effort now will be to expand the American market for foreign products so that other countries can get dollars with which to buy here.

The positive list of commodities which can be exported only under license is still pretty long, but it is being progressively shaved as one commodity after another gets into a good supply-demand balance, as in the case of oil, from which controls were lifted last month. Most of the items that still remain on quotas have military implications one way or another.

The department, however, is finding a few rocks in the field of trade promotion, such as the fact that foreign governments in fixing their exchange rates have set the conversion factors so high that the prices at which their products can be imported are out of line with the domestic market.

On the other hand, some countries refuse to recognize price resistance on the part of American buyers, and have set their prices on a take-it-or-leave-it basis, frequently having their goods left on their hands because cheaper substitutes have been developed, or similar goods can be purchased elsewhere more reasonably.

Disinflation Note

WITH export controls on oil lifted, the next relaxation of controls on commodities of interest to the petroleum industry probably will be applied to steel, with lumber likely to be next on the list.

While Commerce Secretary Charles Sawyer, who runs the export control business, is moving toward a relaxation of restrictions, Agriculture Secretary Charles F. Brannan is putting up stiff opposition. Brannan is top man in mapping out administration strategy, and he sees in the lifting of controls a definite threat to the President's economic stability bill.

The two Charlies are as far apart in their views on inflation as it is possible for two men to get, but Sawyer is expected to go ahead with his decontrol program, the only logical course to take in view of the fact that the supply of oil has long since caught up with demand, the steel industry expects to be on the surplus side within a few months, and the lumber industry already has slowed down.

Just how far Sawyer will be able to go with the lifting of export controls will depend to considerable extent on the administration's program for the rearmament of the Atlantic Pact nations. An ambitious program for military production would take a lot of steel, and might give the steel industry a new target of output to shoot at.

Cold Paper War

WASHINGTON newspaper correspondents, whether they realize it or not, are right in the middle of the cold war between West and East. Fortunately, however, they have become inured over the past 20 years to recurring crises and emergencies, and it can be reported that the propaganda bombardment to which they are being subjected is interfering not at all with their eating, sleeping, and concomitant recreations.

Every mail brings to the news bureaus its quota of propaganda from government agencies and officials, congressmen, and labor, farm, and other organizations who feel they have something to contribute to the thought of the world.

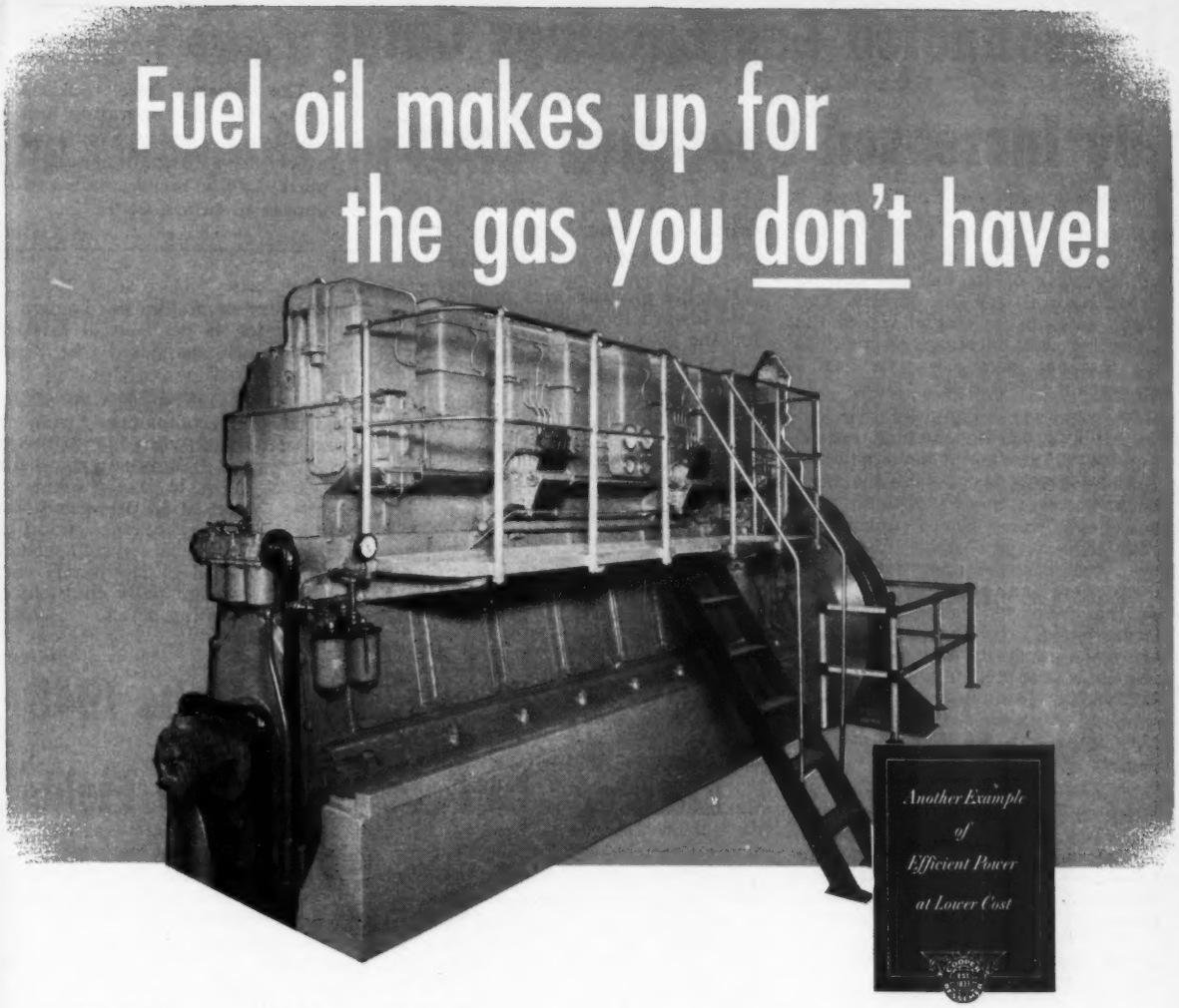
But the representatives of the iron curtain countries who roam our highways and byways picking up morsels of information for the delectation of their bosses in the Kremlin, such as how to make an atom bomb, are also doing a job as molders of public opinion.

There is, for instance, the slick-paper semimonthly which emanates from the Russian Embassy as the U.S.S.R. Information Bulletin, depicting the glories of life in the Soviet Union and showing how silly we are to stick to our poverty of out-moded democracy, and more recently the Romanian News has appeared from the Romanian Legation, both illustrated with pictures of pretty girls, well-fed youths, and handsome new buildings.

From New York, Poland is conducting a rather intensive publicity campaign, and a lot of material is being distributed by such organizations as "Friends of" this or that country.

The conscientious Washington correspondent (and what other kind is there?) reads it all as part of his daily stint and thereby increases his knowledge, learning with delight, for instance, that the Russians invented color television years before any one else. Apparently, however, they tossed it away as too silly for words, along with the horseless carriage, the flying machine, and the blueprints for the Empire State Building, all of which were picked up and used later by those decadent Americans.

Fuel oil makes up for the gas you don't have!



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Consolidated Gas Earnings Cut By Increased Operating Costs

Annual Reports

The Journal here continues giving the 1948 operating highlights of oil and gas companies as revealed in their annual reports. Additional summaries will appear in future issues.

IN spite of the fact that total revenues were more during 1948 than in any year of its history, Consolidated Natural Gas Co., of New York City, states in its annual report that operating costs increased so measurably that net income was reduced to an amount below 1947's figure.

The report shows that total revenue was $103,448,000 during 1948, exceeding 1947's total by 10 per cent; total volume of sales was 213,059,000 M.c.f., or 9 per cent over 1947; and more customers were served during the year than at any other time. However, "all costs of operation in 1948 were increased over 1947, so much so, that increased earnings from the larger sales were not sufficient to offset the generally higher costs; consequently, net income was reduced to $12,265,714, equivalent to $3.75 per share of stock in 1948, whereas, the 1947 total was $14,769,652, or $4.51 per share."

Major items contributing to this loss in net income were higher wages, increased cost of gas purchased, increased cost of equipment, and "the unusually clement winter of 1948-49 experienced in the eastern part of the country."

Construction Completed

Plant-construction program was completed in 1948, as planned, and expenditures in the distribution system, both for replacements and for additional capacity to serve new customers, "will be an annual occurrence, the amount of which will depend upon market developments," the report states.

On December 15, 1948, the system completed its fifth year as an independent-operating unit. During this period continuous increases in business and investment are shown. Volume of sales increased from 127,432,000 M.c.f. in 1943, to 213,059,000 M.c.f. in 1948. Number of customers served has risen from 756,000 to 849,000, and expenditures for plant additions and replacements to handle increased sales amounted to more than $111,000,000.

In spite of construction, gas-supply delays, and other "adverse circumstances attending operations during this 5-year period," the system made material progress toward its ultimate goal of "unrestricted service to all classes of customers in its territory." The report states that it is expected that with realization of Consolidated's goal, curtailments to industry "should be caused only by major emergency operating conditions, or extraordinarily cold weather."

Notable progress was made during 1948 toward increasing supply of gas for the system. Current supplies do not yet equal market demand, and restrictions on sales of gas for certain purposes are still in effect, the report shows. Gas produced and purchased during 1948 totaled 228,981,000 M.c.f., or 12 per cent more than the supply available in the preceding year. Volume of purchased gas increased 15 per cent, to 182,720,000 M.c.f., while volume of gas produced, 46,261,000 M.c.f., was 1 per cent more than in 1947. Increase in purchased gas came entirely from Texas and Mid-Continent fields, the source accounting for 46 per cent of total gas supply in 1948, compared with 38 per cent in 1947.

A total of 158 wells were drilled by subsidiary companies during the year, compared with 145 drilled in 1947. The 1948 drilling program added 38,000,000 M.c.f. to the system's gas reserves, equal to 82 per cent of gas withdrawn by producing operations during the year. The system companies plan to drill 140 additional wells during 1949, principally in their established operating areas.

Pan American Spent Half Its 1948 Earnings in Developing New Fields

MORE than half of the 1948 earnings of Pan American Petroleum & Transport Co., Inc., was invested in finding and developing new oil and gas fields, and in increasing production of crude oil from proven acreage, the company's annual report shows.

Chalking up a better-than-average record in exploratory successes, the firm drilled a total of 99 wells, of which 69 were producers. Included in this figure were 25 wildcat wells, 7 of which were producers. At the end of 1948 Pan American owned 765 wells, which included 675 oil and 90 gas wells.

Important Discovery Made

An important discovery was the opening of new production in Galveston County, Texas, only 5 miles from the firm's Texas City refinery. This area, which the company had already held under lease, added substantially to new reserves, and its convenient location to the refinery made it particularly important, the report shows.

In addition to searching for and finding new crude reserves, the company spent more than $140,000,000 in buying oil from other companies to run through its three refineries. New wells, together with old production, produced a total of 22,793 bbl. of oil per day, and 42,894,404 cu. ft. of gas per day.

Expansion was carried out at the Texas City, Savannah and Baltimore refineries, which included installation of new cracking units, tanks, electrical desalting facilities, and other equipment. The three refineries processed a total of 41,409,137 bbl. of crude, surpassing 1947's peak by more than 1,000,000 bbl. Daily average crude run was 113,140 bbl. as compared with 110,237 bbl. the previous year.

Facilities to produce a cold-application asphalt product suitable for highways and airport runways were completed at the Texas City refinery during the year. More than 65,000,000 lb. of petroleum chemicals were manufactured during the year by the chemical division of Refining Corp. of Texas City.

The company, which owns and operates approximately 1,000 miles of oil and gas pipe lines, expanded its facilities with gathering systems, new connections, and a 16-in. gas pipe line built to meet increasing needs of the Texas City industrial area. The line, running 16 miles from Chocolate Bayou field to Texas City, has a capacity in excess of 150,000,000 cu. ft. of gas daily.

Consolidated net income of Pan American and its subsidiaries during 1948 after provision for taxes and other charges, was $14,281,296, or equiqalent to $3.01 per share of common stock. Earnings were made upon sales totaling $289,362,676 and other income in the amount of $3,738,579.

South Penn's 1948 Earnings Up But Demands for Crude Dropped

EARNINGS of South Penn Oil Co., Bradford, Pa., were greater during 1948 than in any prior year, the company's annual report reveals, and to meet demands of its business, the firm spent the largest sum in its recent history for additional properties and investments.

Consolidated net income reached $8,586,130.71 after taxes and other deductions and after providing reserves of $675,265.74 for contingent losses a balance of $7,910,864.97 was returned to surplus which was equal to $4.59 per share of stock. This compares with net income of $6,750,312.77 during 1947, or $3.86 per share of stock.

Daily average crude-oil production amounted to 11,242 bbl. during the year as compared with 10,634 bbl. in 1947. However, during the first 6 months of 1948 daily average crude-oil production totaled 11,317 bbl., compared with 10,812 bbl. daily during the comparable period in 1947. Indications pointing to decrease in demand for Pennsylvania Grade crude resulted in a production cutback equal to 263 bbl. per day for the year.

Gas Sales Dropped

Natural-gas sales were below those of 1947, and totaled 12,242,942 M.c.f. This compares with 14,034,092 M.c.f. in 1947. A greater amount of gas was used in the company's operations, not only in general repressuring throughout Southwest Pennsylvania and West Virginia, but also in development of Bradford water-flood acreage, where it was injected into intake wells prior to introduction of water pressure. Through installation of gas-collecting systems most of this gas will be recovered during future years of operation.

At the close of 1947 South Penn had no crude-oil stocks available for sale. During 1948 changed conditions in the flow of supply to customers made essential increasing unavailable amount of oil in pipe lines by 52,945 bbl. By the end of the year the company had accumulated 124,189 bbl. additional beyond the amount it could sell to its customers. Therefore, it added 177,134 bbl. to stocks during the year. The firm consequently decreased its posted market price.

In developing its properties, South Penn completed 674 wells comparable with 662 wells in 1947. Of this total, 608 were successfully completed in secondary-recovery development, principally in the Bradford waterflooding area. During 1948 the company continued drilling on its long time held acreage as outlined in 1946-47 reports, and 57 wells were completed, of which 33 were successful and 24 were dry holes.

Amerada Set Production Records During 1948

AMERADA PETROLEUM CORP. established new records during 1948 in geological and geophysical exploration, drilling, and crude-oil production.

The company had a net crude-oil production in 1948 of 22,660,576 bbl. (61,914 bbl. daily average) as compared with a daily average of 54,977 bbl. in 1947. Drilling during 1948 accounted for a total of 296 wells, including 208 oil wells, 8 gas wells, and 80 dry holes.

Geological and geophysical exploratory work continued during the year in all sections where the company is interested, but especially in the Rocky Mountain area and in the province of Alberta, Canada. At year's end the company held full or part interest in approximately 3,313,000 acres of oil and gas leases situated principally in the states of Texas, Oklahoma, California, Louisiana, New Mexico, Colorado, Wyoming, Montana, Utah, Mississippi, and Kansas.

Amerada is cooperating with other companies in the building of jointly owned gasoline extraction plants in Sholem Alechem field, Oklahoma, and Todd field, West Texas.

During the year the company became associated with Continental Oil Co. and Ohio Oil Co. in the formation of Conorada Petroleum Corp. in which each of the companies mentioned holds a third interest. Conorada has been organized to investigate the possibilities and prospects for development of oil production in foreign countries.

Net profits per share of stock in 1948 were $14.35 as compared with net earnings per share of $9.46 in 1947.

I.P.A.A. Meeting Set for May 2-3 in New Orleans

The nineteenth midyear meeting of Independent Petroleum Association of America will be held at Roosevelt Hotel in New Orleans May 2-3. Advance committee meetings will be held May 1, including committees on secondary recovery, stripper wells, and supply and demand.

"The Positive Approach" to preservation of freedom of enterprise in development of oil and gas, and other American industries, will be topic of the major address, to be given by Paul D. Bagwell, president, United States Junior Chamber of Commerce.

Next Week

The Journal's Annual Natural Gasoline Number.—Published in connection with the annual meeting of the Natural Gasoline Association of America. Convention papers will be featured along with special articles developed by members of the Journal staff. An exclusive feature of the issue is the Journal's annual survey, plant by plant, of all natural-gasoline and cycling operations in the United States.

Besides the papers on natural-gasoline and cycling plants, other articles to appear will be:

Stream pollution-control program.—George F. Ullrich of Esso Standard's Baton Rouge refinery describes how a separate department of his company handles all activities concerned with this problem.

Atlantic's program in reducing gas-oil ratios in Wasson field.—David Stormont of the Journal's editorial staff describes procedures and results of Atlantic's successful program of well workovers in this West Texas field.

Oil operations in the Philippine Islands.—Carl L. Cain, party chief of Western Geophysical Co. International, discusses the area's first post-war seismic survey.

Shell Oil's field laboratories.—An exclusive Journal article describes the core and formation-sample laboratories which will be operated at Odessa, Houston, and New Orleans.

Drilling problems in the Gulf Coast.—P. E. Chaney, Sun Oil Co., Beaumont, presents features of abnormal pressures encountered in this area together with possible association to lost circulation of drilling fluid.

Status report on Benedum field.—Current development, drilling conditions, structural data for this deep Ellenburger pool in West Texas are given by Charles J. Deegan of the Journal.

PERSONALS

Sullivan Process Head For Indiana Standard

PIKE H. SULLIVAN, manager of the development and patent department of Standard Oil Co. (Indiana), joined the company as general patent attorney in 1938. He became assistant manager of the development and patent department in July 1942 and was named manager of the department later the same year.

Previous to joining Standard, Sullivan served as general patent attorney and secretary of two New York companies and engaged in general practice of patent law in Chicago.

He is a member of various bar associations including the American Bar Association and the American Patent Law Association, and has been active on several committees of the latter group.

A native of Decatur, Ill., Sullivan received his law degree from the University of Chicago after attending the University of Illinois and James Millikin University.

R. W. Heath has been elected as a vice president of Signal Oil & Gas Co. Heath, who has been manager of the gas department for many years, became a member of the board of directors last year. A graduate of Stanford University, he is a charter member of the California Natural Gasoline Association and has served as president of that group.

J. L. Lamb, assistant to the president of Signal Oil Co., has announced his retirement. A graduate of Grinnell College, Iowa, he settled in California in 1928, joining Signal Oil shortly afterward. He was named assistant to the general sales manager in 1940 and held that position until being named assistant to the president.

A. A. Phillips has joined Humble Oil & Refining Co., Midland, Tex., division, as production geologist. He is a recent graduate of University of Oklahoma, with a degree in geology. He is currently assigned to the Wink district.

Recent transfers of Mene Grande Oil Co. personnel in Venezuela include **P. G. Cloonan,** accounting department, from San Tome to Maracaibo; **Frank Mischler,** drilling foreman, who has been in charge of Apure operations to the Maracaibo area; and **K. L. Wehmeyer,** geologist, from San Tome to West Venezuela.

W. A. Tracey, manager of bulk sales for Sinclair Refining Co., at Fort Worth, has been promoted to Washington sales representative, succeeding **Thomas P. Conlon,** who resigned.

Ben F. Hake has been named director of engineering geology for the production department of Gulf Oil Corp. in Pittsburgh. Prior to entering military service he was district geologist in the Illinois area for Gulf. During World War II he served as a lieutenant colonel in the Fuels and Lubricants Division of the Army. Since his return to Gulf he has been executive assistant to **C. W. Hamilton,** vice president in charge of foreign divisions.

Personnel of Mene Grande Oil Co. recently arrived at Maracaibo include: **J. P. Thompson,** cadet petroleum engineer; **C. W. Stewart,** office engineer; and **K. T. Brock,** production department utility clerk. Recent Mene Grande arrivals at San Tome include: **N. W. Neaderhiser,** production department junior engineer; **J. K. Blake,** junior geologist; **W. L. Fouche,** engineer; **Allen B. Benson,** production department utility clerk; and **Allen G. Pike, Jr.,** production department junior engineer.

E. C. Steele, general superintendent of Union Gas Co. of Canada, Ltd., has announced his retirement after 48 years in the gas industry. He began his career in the Welland gas fields in 1901, joined Provincial Natural Gas Co. 4 years later, and in 1918 was named assistant to the superintendent of Union Gas. He was later named superintendent of transmission and distribution.

Howard Wyckoff, previously an engineer with the Brinkerhoff Drilling Co., Pilot Butte, Wyo., has been named chief engineer of the company and will make his headquarters in Casper, Wyo.

W. H. Hodnett, previously head of Atatl Royalty Corp., has been elected president of Crowell & Steels, Inc., Houston geophysical firm.

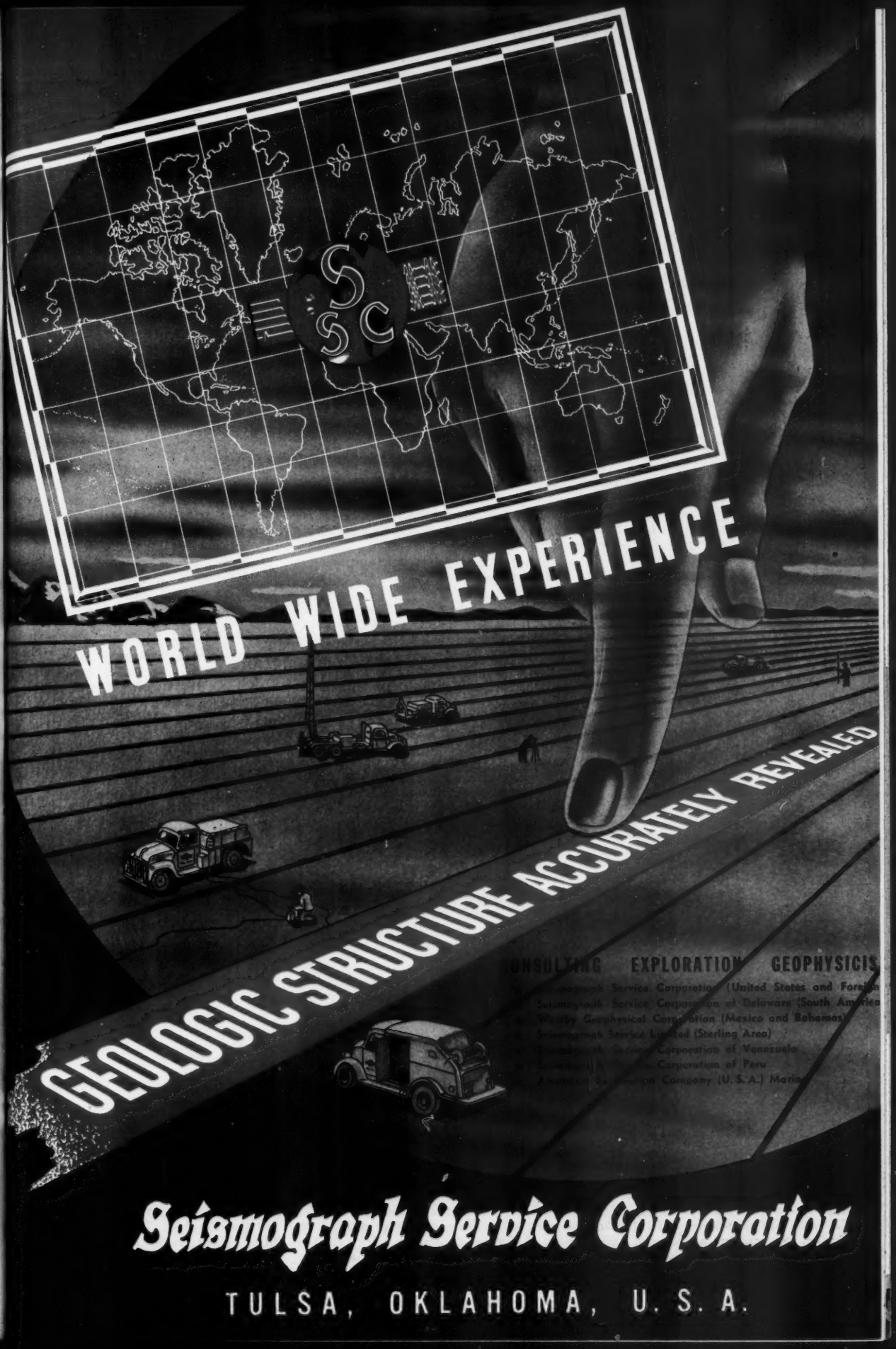
Clarence H. Taylor, manager of rentals for Gulf Oil Corp., Tulsa, Okla., has retired after 38 years of service with the company.

W. HAROLD REA

W. Harold Rea has been named as president of Canadian Oil Companies, Ltd., succeeding the late **John Irwin.** At the same time it was announced that **P. A. Thomson** had been appointed to the newly created post of chairman of the board. Rea joined Canadian Oil Companies, Ltd., in 1933. During World War II he was executive assistant to the oil comptroller for Canada in charge of transportation and supply. Following the close of the war he was appointed executive assistant to the president. Rea brings to his post a wide background of industry experience particularly in the auditing, sales administration, and supply procurement divisions of the petroleum industry.

Officers and directors of the Anderson-Prichard Oil Corp. recently reelected during the annual stockholders meeting at Oklahoma City were as follows: **L. H. Prichard, Sr.,** chairman of the board; **Roland V. Rodman,** president, and **T. H. Marshall,** vice president and treasurer. Directors are **Hugo A. Anderson** and **Charles F. Glore.** Vice presidents are **R. W. Brauchil, George H. Burrus, C. H. Dresser, J. R. Lewallen, C. L. Mayhall,** and **Weston Payne.** Secretary and assistant treasurer is **Neale Boyd,** while **S. A. Garrison** and **Roy Winters** are assistants secretary-treasurer.

Dr. George S. Hume has been named director of the mines, forests, and scientific services branch of the Mines and Resources Department of Canada with headquarters at Ottawa. He has been associated with the department for 25 years and as head of the geological survey of Canada carried on extensive investigations into


WORLD WIDE EXPERIENCE
GEOLOGIC STRUCTURE ACCURATELY REVEALED
CONSULTING EXPLORATION GEOPHYSICISTS
Seismograph Service Corporation (United States and Foreign)
Seismograph Service Corporation of Delaware (South America)
Worby Geophysical Corporation (Mexico and Bahamas)
Seismograph Service Limited (Sterling Area)
Corporation of Venezuela
Corporation of Peru
Company (U.S.A.) Marine
Seismograph Service Corporation
TULSA, OKLAHOMA, U.S.A.

PERSONALS

oil and gas possibilities in many parts of Canada. As director he will supervise work concerned with the discovery and development of mineral, forest, and water resources throughout Canada.

Victor Chancellor, district superintendent of the Cushing, Okla., district for Sinclair Prairie Oil Co., has been appointed to take charge of production for Sinclair Oil & Refining Co. in Caracas, Venezuela.

C. J. Tighe, engineer for Stanolind Oil & Gas Co., has been named plant superintendent of the company's new Stano gasoline unit at Ulysses, Kans. Formerly a field project engineer at the plant site in charge of construction, he now assumes responsibility for all operations of the unit.

Carl H. Zwick has been named assistant land man for the Sunray Oil Corp. in its Tulsa offices. He was formerly associated with Henshaw Brothers, drilling contractors and producers at San Antonio, Tex., and recently was land man for Shell Oil Co., Inc., Oklahoma City.

Dr. W. E. Hanford, director of Petroleum and Chemical Research for M. W. Kellogg Co., has been elected a vice president of the organization. **H. R. Austin,** president of the company, in making the announcement stated it reflected the steadily growing scope of development work in Kellogg operations. Dr. Hanford, who joined the Kellogg organization in 1946, was formerly associated with General Aniline & Film Corp. as director of research. He was appointed to the newly created post of director of petroleum and chemical research at Kellogg last year.

Charles T. Whitney, former superintendent for Coastal Drilling Co., Los Angeles, has been appointed general manager in charge of all drilling operations.

B. H. Dresser and **Newcomb D. Taylor** have been elected assistant secretaries of the Hancock Oil Co., Long Beach, Calif.

C. J. Hoke, formerly a geologist with Phillips Petroleum Co., is now chief geologist for C. H. Murphy & Co., Eldorado, Ark.

R. B. Wheeler and **P. K. Bunke** have been named assistants to the district superintendent for S. A. P. Las Mercedes, Venezuela. **J. F. Caston** has been promoted to Wheeler's position as district geologist and **M. S. Wise** has been named district engineer.

Hugh W. Lambert, previously superintendent for Pan American Pipe Line Co., Longview, Tex., has rejoined Britton Construction Co. in Washington, Pa.

Frank M. Brooks, manager of El Dorado Refining Co.'s geological, land, and production departments, has been named to the firm's board of directors.

Several changes have taken place among geological personnel of the Amerada Petroleum Corp. at Midland, Tex. **Roland S. Lakson** has joined the company as a geologist and has been assigned to the scouting department. **Elmer S. Lynn,** geologist formerly serving in the scouting department, has been transferred to the company's production station at Monument, N. M. **Carl Rose,** geologist previously stationed at Monument, has been shifted to the Midland geological department.

R. M. Baskin, executive assistant in charge of land and government representation matters for Mene Grande Oil Co., has been transferred to Venezuela Gulf Refining Co. and will act as its representative in Caracas.

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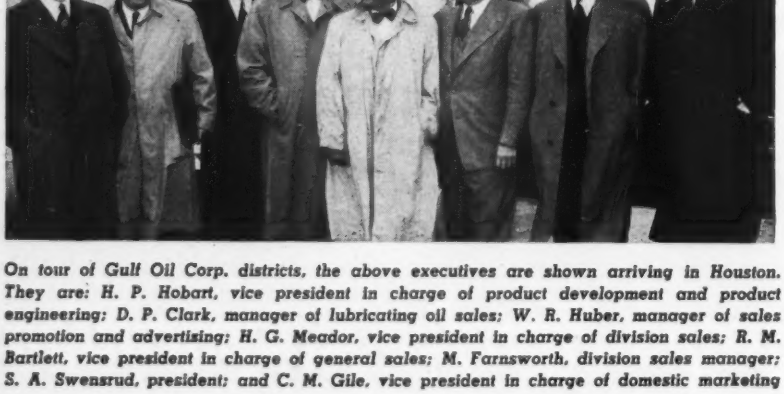
Thomas B. Slick, independent oil producer, has been named a member of the directors of Stanford Research Institute, a nonprofit organization of applied research affiliated with Stanford University. Slick also had a share in the formation at San Antonio of the Foundation of Applied Research, the Institute of Inventive Research and the Southwest Research Institute.

C. F. McGoughran has been appointed general sales manager and **Marc F. Braeckel** assistant general sales manager for Sinclair Refining Co. McGoughran, who joined the company in 1920, began work in the refinery, later transferring to the sales department. He served in various sales capacities until 1940 when he was transferred to the home office as assistant manager of lubricating sales. Later named manager of sales training, he was appointed executive assistant to the vice president in charge of marketing in 1946. Braeckel, who was previously president of Richfield Oil Corp. of New York, joined that company in 1930 after affiliation with other petroleum companies including the Richfield Oil Corp. of California. With Richfield Oil Corp. of New York he held the positions of branch manager of bulk sales, general sales manager, treasurer, and vice president. These appointments by Sinclair are designed to improve sales efficiency.

Rene de Montigue, president of Cie Francaise Distribution des Petroles en Africa, is now in the United States on a business trip.

Otto Ryf, manager of the real-estate department of Signal Oil Co., has announced his retirement from the company to enter the real-estate business.

Charles E. Crenshaw has been appointed chief of the attorney general's oil, gas, and transportation division for the State of Texas. He replaces **Elton Hyder** who resigned to enter private business.



On tour of Gulf Oil Corp. districts, the above executives are shown arriving in Houston. They are: H. P. Hobart, vice president in charge of product development and product engineering; D. P. Clark, manager of lubricating oil sales; W. R. Huber, manager of sales promotion and advertising; H. G. Meador, vice president in charge of division sales; R. M. Bartlett, vice president in charge of general sales; M. Farnsworth, division sales manager; S. A. Swensrud, president; and C. M. Gile, vice president in charge of domestic marketing

Robert H. Martin, geologist for The Texas Co. at Wichita Falls, has been promoted to district geologist and transferred to Amarillo, Tex.

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James Tanham, vice president of The Texas Co., is attending the fourth conference of American States Members of the International Labor Organization in Montevideo, Uruguay, as the United States delegate representing industry.

Vernon C. Rosenstahl, attorney for Stanolind Oil & Gas Co. in Tulsa, has been named division tax commissioner for the company in Oklahoma City.

Robert J. Ball, Sun Oil Co., Marcus Hook, Pa., has been appointed port captain of the company's marine department at Marcus Hook. He succeeds **Capt. George R. Snyder,** who retired recently.

Russell J. Cooper has been appointed assistant manager of The Texas Co.'s personnel department, in New York City.

James P. Ford, formerly secretary to the president, Deep Rock Oil Corp., has been named manager of the northwest sales area, with offices at Minneapolis, Minn. **C. W. (Budd) Dyniewicz,** formerly in charge of batteries, tires, and accessories division, has been named manager of the merchandising department.

SHIFTS—

David H. Sears, geologist, Shell Oil Co., Inc., Simi to Templeton, Calif.; **Milton R. Beychok,** engineer, Shell Oil Co., Inc., San Francisco to Wilmington, Calif.; **Caswell Silver,** geologist, Florence Drilling Co., Aztec, N. M., to Ballinger, Tex.; **Norton E. Fincher,** engineer, Humble Oil & Refining Co., Paducah, Tex., to New Iberia, La.; **William A. Vestal,** engineer, Phillips Petroleum Co., Alvin, Tex., to Smackover, Ark.; **W. J. Armstrong,** foreman, Sun Oil Co., Beaumont to Mont Belvieu, Tex.

C. L. Conn, superintendent, Moran Bros., Burkburnett to Wichita Falls, Tex.; **B. L. Beaird,** superintendent, Placid Oil Co., Dallas, Tex., to Shreveport, La.; **W. N. M. Smith,** foreman, Republic Exploration Co., Hebbronville, Tex., to Tulsa; **O. J. Shirley,** engineer, Shell Oil Co., Inc., Houston, Tex., to Hugoton, Kans.; **W. L. Crothers,** engineer, Humble Oil & Refining Co., Houston to Midland, Tex.; **C. A. Hansen,** engineer, Humble Oil & Refining Co., Houston, Tex., to New Orleans, La.; **H. L. Hensley,** engineer, Humble Oil & Refining Co., Katy, to Midland, Tex.; **R. John Catlett,** engineer, T & P Coal & Oil Co., Odessa to Plains, Tex.; **W. K. Patrick,** foreman, Standish Pipe Line Co., Pampa to Borger, Tex.; **Ben H. Freeman,** engineer, Stanolind Oil & Gas Co., Lake Charles to Lafayette, La.

Arnold F. Lewis, superintendent, Clemens Exploration Co., Princeton, Ind., to Newaygo, Mich.; **Dan C. Towry,** engineer, Phillips Petroleum Co., Florence to Jefferson City, Mo.; **Maurice MacDonald,** engineer, M. W. Kellogg Co., Williston Pary, N. Y. to Madison, N. J.; **Eugene C. Eaton,** geologist, Stanolind Oil & Gas Co., Craig, Colo., to Casper, Wyo.; **William P. Bush,** engineer, Ohio Oil Co., Casper to Powell, Wyo.; **Paul Quillin,** engineer, Sohio Petroleum Co., Elmore City, Okla., to Russell, Kans.; **James C. Burtner,** engineer, Phillips Petroleum Co., Texhoma, Okla., to Wooster, Ohio; **James W. Vanderbeek,** geologist, Stanolind Oil & Gas Co., Bogota, Colombia, S. A., to Casper, Wyo.; **Frank O. Mortlock,** superintendent, Gulf Oil Corp., Moultrie, Ga., to Fort Worth, Tex.

DEATHS

Herschel Eugene Denton, 42, prominent petroleum engineer who played an important role in developing the Canadian oil industry, died March 30 in Calgary, Alberta, Canada. A graduate of Montana State College and New Mexico A. & M., he worked with Ohio Oil Co. before organizing a consulting engineering firm, Denton-Spencer, Ltd., and a drilling contracting company, General Petroleums, Ltd., in Canada in 1941. Four years later he organized Superior Oils, Ltd., an oil exploration and development firm.

W. J. Stewart, 89, formerly production superintendent of Devonian Oil Co., died April 9 in Tulsa. A veteran oil man with 70 years of industry experience, he was honored for his contributions to the oil business during the International Petroleum Exposition held in Tulsa in 1936.

James H. Wilson, 54, an employe of Humble Oil & Refining Co. for 30 years, died April 8 at Henderson, Tex.

William Lee Albaugh, 54, oil driller and pioneer in many Texas field developments in the past 30 years, died April 6 in Big Spring, Tex.

Martin Yates, Jr., 67, one of the discoverers of southeastern New Mexico oil, died April 2 in Artesia, N. M.

J. D. Kimmel, 65, an oil scout during the early days of the industry in the Mid-Continent area, died April 5 at Santa Monica, Calif.

James E. Briley, 48, member of the personnel department of Deep Rock Oil Corp., died April 6 in Tulsa.

Fred F. Frey, an independent oil man, died April 9 in Oklahoma City.

Robert C. Patterson, 62, consulting petroleum engineer, died April 3 in Glendale, Calif. He was associated for 23 years with the U. S. Bureau of Mines and the U. S. Geological Survey.

H. M. Amsler, 51, vice president of Richrock Royalty Co. and a director of Tennessee Gas Transmission Co. and Sterling Oil & Refining Co., died April 3 in Key West, Fla.

James P. Koons, 70, employed as chief gager in the pipe-line division of Mid-Continent Petroleum Co. until his retirement 2 years ago, died April 7 in Tulsa.

Charles B. Johnes, 81, chairman of the board of Mohawk Refining Corp., died April 7 at his home in Newark, N. J.

Robert E. Neilson, a member of the oil field equipment business in Tulsa for many years, died April 10 in Oilton, Okla.

Sidney H. Ball, 71, geologist and mining engineer, died April 8 in New York.

Edward Dixon, 60, a dispatcher for Sinclair Refining Co., died April 5 in New Rochelle, N. Y.

Forest B. Smith, 51, former chief land man for Humble Oil & Refining Co. who retired less than 2 years ago, died April 4 in Greenfield, Ill.

Raymond E. Johnson, 48, an employe of the Atlantic Pipe Line Co., died April 8 in Midland, Tex.

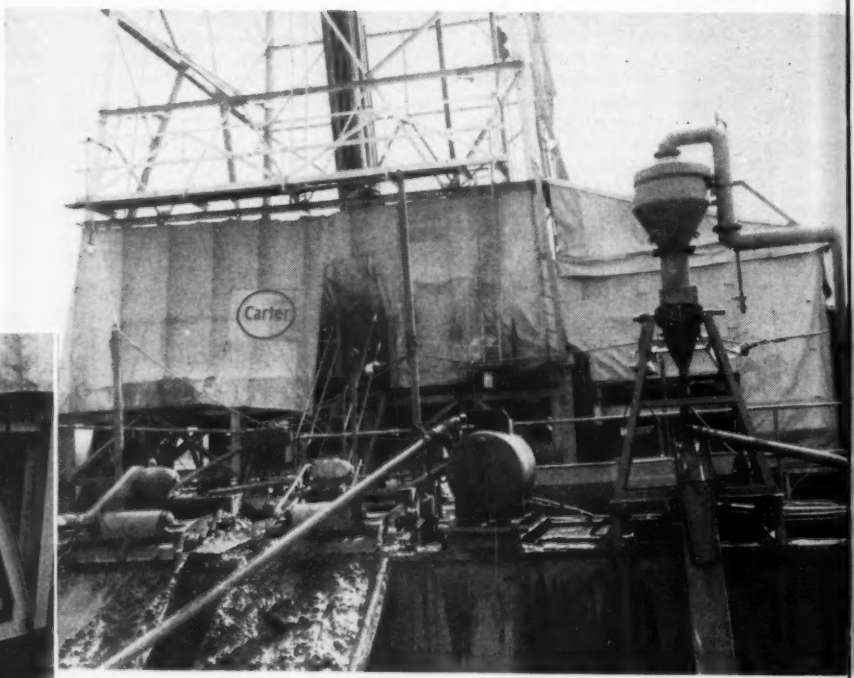
W. D. Faurot, 79, associated with C. E. Roth in the Roth & Faurot Oil Co. for 35 years, died April 9 in Independence, Kans.

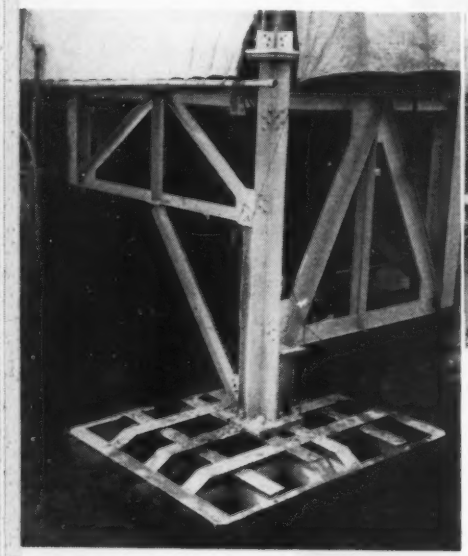
Efficiency and Power

mark new rig of Carter Oil Co.

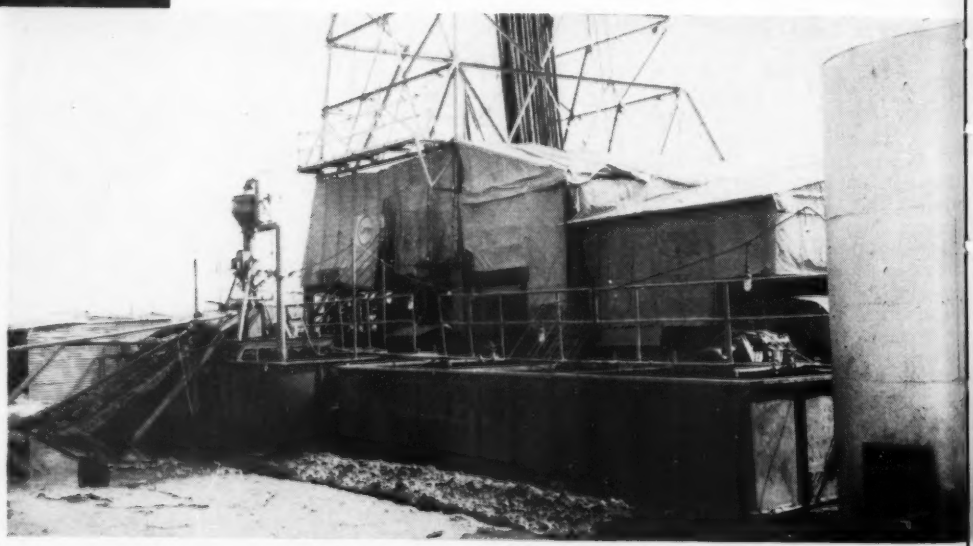
Engineered Mud System Simplifies Treating

by Roy F. Carlson





Much of the cleaning and treating equipment is mounted on the first of two steel pits as shown in the view above. Two shale shakers are installed, plus an impeller-type chemical mixer and a single-head desander. A general view of the mud system is given in the photograph below, the clean-mud storage tank shown at right. The engine house and windbreak are of plasticized canvas



Loads on the derrick and derrick floor are transmitted to corner posts which are supported by integrated 8 by 10-ft. steel grillage. Although ground at this location is wet, the grillage has given adequate support with little or no settling. This well is being drilled to a depth of over 10,000 ft.

REDUCTION of total mud costs through increased efficiency and optimum use of materials, labor, and machines has been the objective in the design of a compact and complete mud system, in use by Carter Oil Co. on its 2 Herbert Harris in East Lindsay field of southern Oklahoma. The design of the new system was instigated by the purchase of a new rig, new from crown to substructure.

Although many new devices have been incorporated into the rig, the mud system itself provides the most interest. Engineering of the mud system was carried on with reduction of working volume of the mud system as the foremost objective. With the smaller mud volume in use during drilling operations, treating of the mud is simpler, faster, and more economical. The mud volume can be kept small by close control of its properties, and by eliminating the necessity for jetting valuable mud to the reserve pits in order to clean the pits of solid materials. The system was also engineered to provide a compact, easily assembled and disassembled, integrated unit.

Welded Steel Pits

Two 220-bbl. welded steel pits provide working space at the surface for screening and mixing of mud. In addition, a 300-bbl. cylindrical tank is installed at the location for storage of clean mud for use in emergencies, and for making up mud losses. Clean-water storage is also provided. The pits are set in line with easily made-up and broken connections between the tanks and suction and discharge lines. Each pit with its attachments and connections is designed to be moved as a unit.

As will be noted on the accompanying sketch, each of the pits is provided with bottom-type guns for agitation of the mud. These guns are rigidly mounted in the tanks near the bottom, and are equipped with several ½-in. jets. Total jet area in each of the tanks is equivalent to that of a 2-in. pipe, with the jets so directed as to sweep the entire pit bottom during an agitating operation. Mud for operation of the jets may be pumped from either of the pits or from the reserve tank of clean mud.

Two mud screens are mounted on the first of the two tanks, manifolded together for use singly or simultaneously. Each has an effective area of 16 sq. ft. and their total capacity is 1,600 g.p.m. Curved screens accelerate removal of the larger cuttings from the mud stream.

Impeller Mixers

A jet-type hopper is installed in the mud house for proportioning of dry additive material. Also, dry-mud conditioners such as weighting material, gels, and clays can be added into the mud system from a motor-driven impeller-type mud premixer. This kind of mixer was installed in the belief that higher yield may be obtained from a given amount of additives by thorough wetting of additive particles in the premixer than by conventional mixing. Consequently, a lower over-all conditioning cost may be realized.

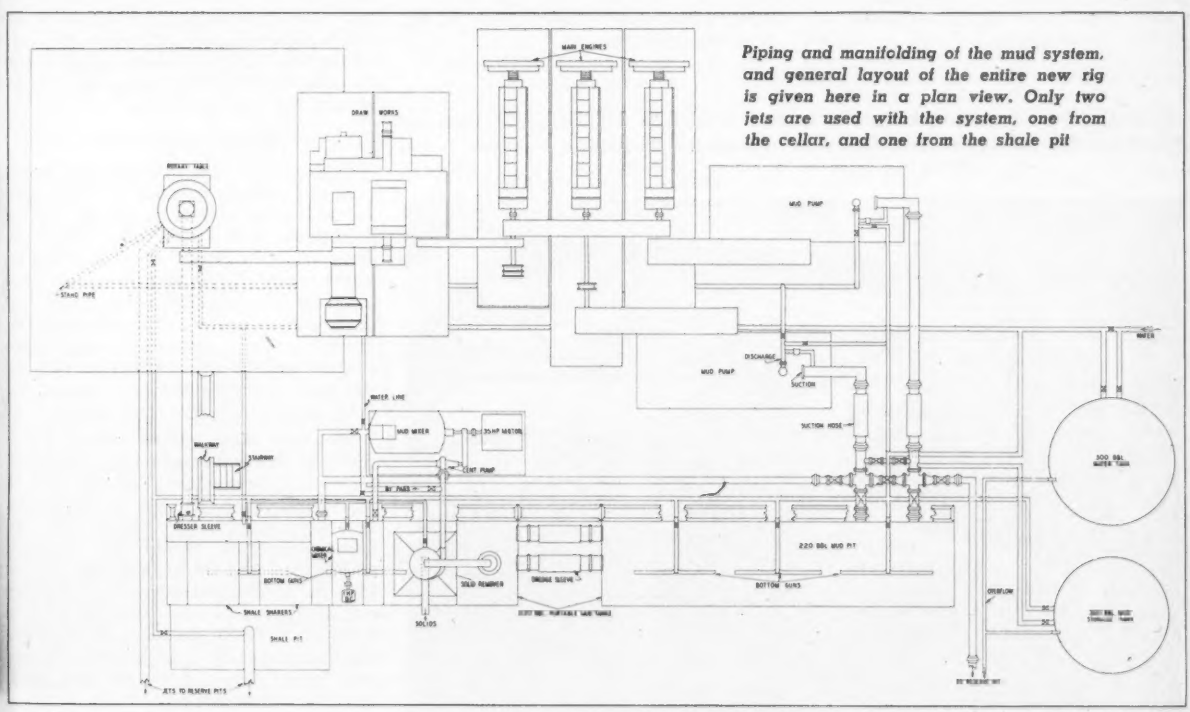
A small impeller-type electrically driven chemical mixer is also mounted on the first tank, and has been found to save time and to do a more efficient job of chemical mixing than conventional means. A large degree of safety is also given by the mixer in the reduction of the number and severity of burns suffered by men manually mixing the chemicals.

It will be noted from the drawings that no provision has been made for jetting directly from the working tanks to the reserve pits. Only two jetting arrangements have been made, one from the cellar to the reserve pit, and one from the shale pit at the discharge of the mud screen to the reserve pit, for the removal of cuttings from the shale pit. Fine solid material may be removed from the pits only through the suctions of the two mud pumps. No provision has been made in this system for adjusting the level of the mud in the pits to allow for settlement of fines. All these factors have been discarded from the design because it is planned to keep the mud free of sand and fines at all times.

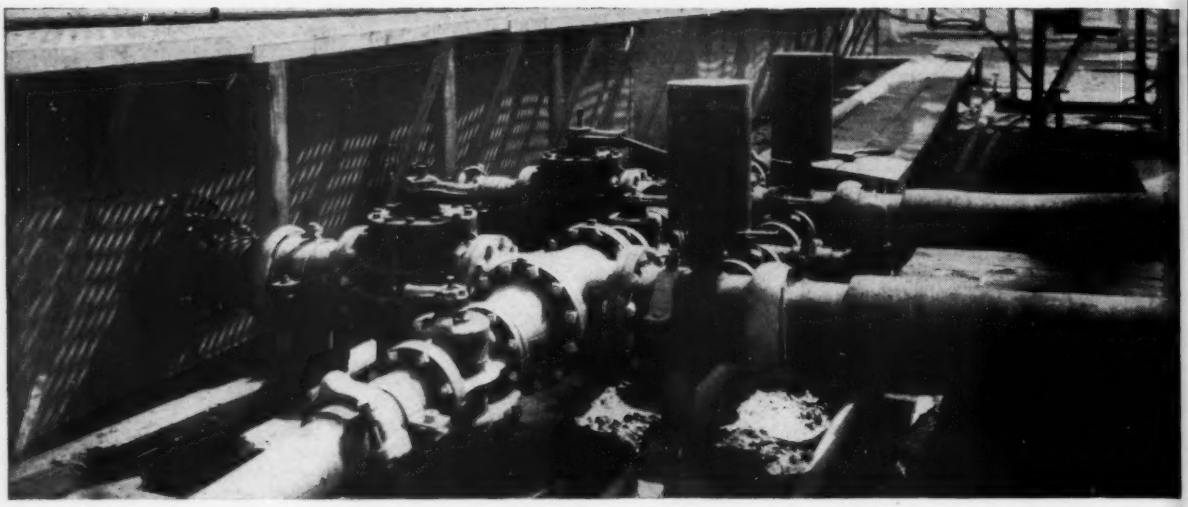
Centrifugal Desander

To augment the cleaning action of the mud screens, a single-head desander has been installed on the first of the pits. For the Mid-Continent area it is planned to run the desander at all times during the early part of the hole. The desander is designed to remove centrifugally sand and other undesirable solid particles from the mud. It is fed through a high-volume low-head centrifugal pump which is driven by the motor which also drives the dry-mud mixer.

Suction lines for this pump connect with both pits, and the discharge leads



Piping and manifolding of the mud system, and general layout of the entire new rig is given here in a plan view. Only two jets are used with the system, one from the cellar, and one from the shale pit



Compact manifolding of mud lines is featured on the rig. Pump suctions have 10-in. diameter

overhead to the entrance of the desander. Operation of the desander need not interfere with normal drilling. It may be run continuously when contamination of the mud is greatest, or it may be run intermittently. If contamination becomes exceptionally severe, the solids remover may be run while coming out or going in the hole. During batch cleaning of the working pits, the pits are thoroughly gunned through the bottom guns and the entire system pumped through the desander. Maximum cleaning rate is from 400 to 800 g.p.m.

New Engine Types

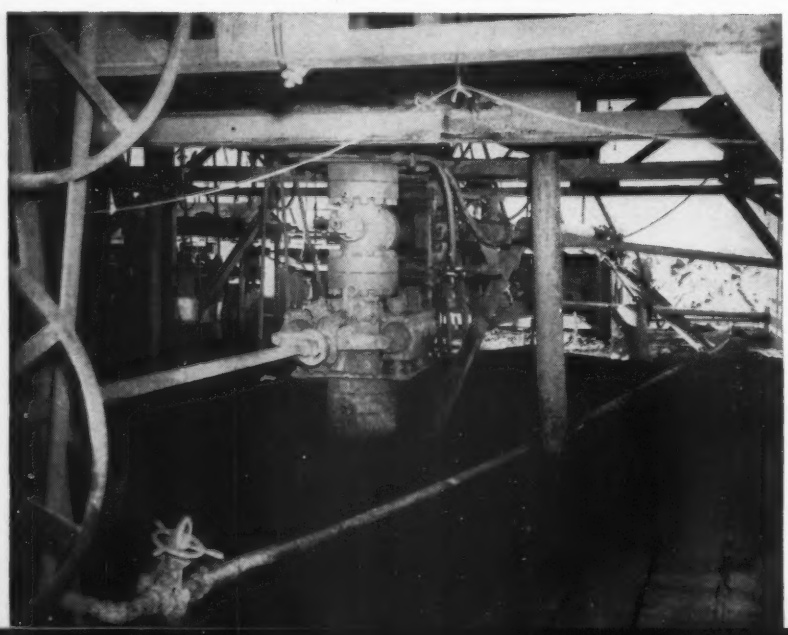
One of the first applications of dual-fuel engines in the Mid-Continent area, the rig is powered by three large engines, each of which delivers 375 hp. continuously or 450 hp. intermittently. The dual-fuel characteristic, permitting either diesel fuel or a natural gas and diesel fuel mixture to be used for combustion, makes it possible to use the engine in either a developing field where a supply of gas is available, or in a wildcat location where diesel fuel must be used alone.

During the mixed-fuel operation, the engine continues to run on the diesel principle with diesel fuel in a quantity equal to from 10 to 15 per cent of full-load oil consumption. The oil acts as a pilot to ignite the gas, and furnishes an excellent method of control over gas operation. The ratio of gas to fuel oil during operation will vary from a few per cent at idling conditions to from 80 to 90 per cent under full load.

In the interests of providing increased head room beneath the rig, a 10-ft. 4-in., 1,000,000-bbl. four-post truss-type substructure was adopted. With this arrangement, all loads, including the weights of drill pipe and rotary table loads, are transferred to the corner posts of the substructure. This type of structure eliminates many of the vertical and inclined columns used in A.P.I. structures. With the number of vertical load-bearing columns reduced to a minimum, the foundations problem is also decreased.

To lessen the amount of wood necessary in the construction of the derrick foundation, 8 by 10-ft. reinforced H-beam steel grillage is used beneath the derrick corners. The grillage system can be reused indefinitely, is easily moved, and provides an adequate derrick foundation. The 800,000-lb. derrick is of the standard 136-ft. design with a 30-ft. base.

Accessibility to the blowout preventers is afforded by the truss-type substructure. Note the free space beneath the derrick floor. Power for operating the blowout preventers is furnished by a pump on the far side of derrick



Hoisting Equipment

Draw works for this new rig has a nominal rating of 12,500 ft. with 4½-in. drill pipe and is equipped with a dynamatic auxiliary brake. Of 60-in. diameter, the brake is applied by an air-operated disengaging jaw and gear tooth coupling when load increases past some predetermined minimum value actuating aggressive switch and is automatically released by this pressure switch when the load decreases past that value.

The two mud pumps each have a 3,000-lb. maximum working pressure, a water-cylinder bore of 7¾ by 18 in. and deliver 350 hp. at 50 s.p.m. Ten-inch suctions are used with the pumps. Derrick equipment is rated at 300 tons and the rotary table has a 20½-in. opening. Blowout preventers are of the quick-ram charge with a 5,000-lb. working pressure. Preventers are hydraulically operated, fluid pressure being supplied by an independent air-driven pump.

THINGS YOU CAN'T CALCULATE ON YOUR SLIDE RULE

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Costs—

A tested system for their control

by R. S. Stewart and H. A. Gustafson**

This is a symposium on "Refinery Maintenance." The symposium is complete in this one issue and four different articles on this and following pages are devoted to the subject as follows: (1) costs, (2) scheduling, (3) shops, (4) specific problems.

Benefits from improved refinery maintenance are many. The productivity of the worker increases. Shutdowns and turnarounds are shorter and less frequent. Refinery output increases. Repairs last longer. Equipment operates efficiently. By utilizing existing equipment a larger percentage of the time and of capital expenditures for expanded capacity is conserved. These are some of the advantages realized from better maintenance practices. They save money. They reduce the cost of refinery operation. They apply to small as well as to large refineries.

IN outline, our program to control maintenance costs consists of two broad phases. The first requires accurate and current cost figures. This meant revising and adapting our refinery accounting methods to supply maintenance information. Such statistics are necessary in a convenient form for analysis and decisive action. But—the clerical time and cost must not outweigh the value gained. The second phase involves initiating modern industrial engineering practices.

Control is accomplished in three distinct steps:

1. **Planning**—to meet specific objectives.
2. **Doing**—according to plan.
3. **Comparing the result** — looking for improvements.

Summing up, when we speak of control, it is in terms of these three steps: careful planning to meet specific objectives; execution according to plan; and frequent comparison and investigation to gage the success of the resulting performance.

Use of Automatic Business Machines

To gather, assimilate, and report basic maintenance statistics, an automatic business-machine installation was selected. Briefly, these machines translate alphabetical and numeric data upon small punched cards, segregate those data that are desired, make calculations upon them, and print in report form the resulting information. Three distinct steps are involved (Fig. 1): The first machine translates field information into record cards through the medium of punched holes.

Only information put into the cards will emerge in the final reports. Therefore, some discretion must be exercised in making the initial selection.

The second basic machine segregates and arranges the record cards in sequence or in groups. The third basic machine takes these sorted cards and retranslates the information from them onto a continuous paper roll. Auxiliary machines are available to supplement these basic operations.

Our new installation does most of the clerical tasks automatically. Once the information is "punched into" the cards, the sorter permits selection of various combinations. Thus, from the same group of cards, we can determine:

1. The number of man-hours each craft spent on a particular job.
2. The cost of material or labor during any period.
3. Costs for each refining division, etc.

The information is available in report form in a matter of minutes. Under the old system, such information would require days to sort, acumulate, and report. The possibility of human error was ever present. Combinations could not be changed easily. Through the automatic business machines we get current figures, in any combination desired, with little manual effort. We have multiplied the productivity of our clerical workers. We have access to information never before available. We have it when we need it, and in the form it will be best for us to use.

The machine installation is rented from a business-machine company on a monthly basis. For our various refinery installations, the rental costs and personnel requirements are as shown in Table 1.

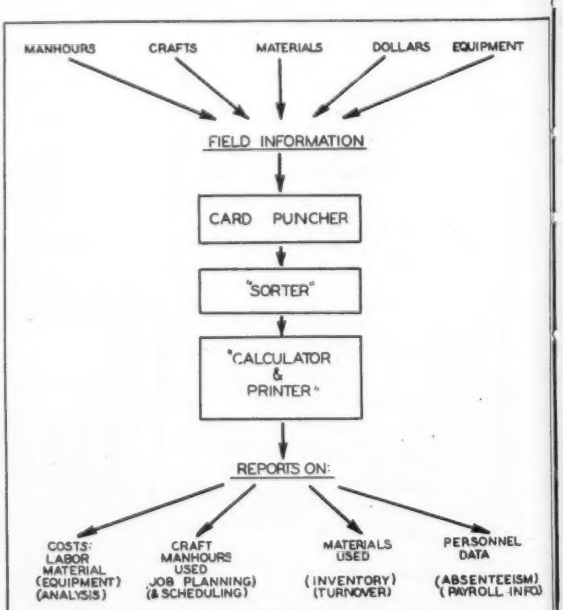
Procedure for Gathering Maintenance Information

The importance of current cost figures in a rapidly changing economy is apparent. For management to make intelligent decisions; for it to take advantage of new conditions, or to

TABLE 1—COST OF BUSINESS-MACHINE INSTALLATION

Refinery	Crude throughput per day (bbl.)	Rental cost per month	No. of clerical personnel required*
A	40,000	$1,015	6
B	20,000	$906	5
C	18,000	$740	2½
D	17,000	$722	4

*No material increase or decrease has been made in our total clerical force. The same personnel now prepare many additional reports for company and governmental use.



Flow of maintenance statistics

*Standard Oil Co. (Ohio), Cleveland. Condensation of paper given at midyear meeting of A.P.I. Refining Division, Houston, April 4-7.

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recognize trends and take appropriate steps, proper information, speedily organized, is essential. As the ladder of management is descended, the data must be more detailed and refined. The scope of attention narrows. One of the chief advantages of the automatic business-machine installation is its flexibility to meet this varying demand.

Before making use of these machines, however, several accounting changes were necessary. The first involved reclassifying and numbering chargeable accounts in each refinery.

The establishment of chargeable accounts, the determination of subdivisions for further cost analysis, and the use of identifying numbers was the first tool in our control setup. The code numbers are used principally in the accounting office as a speedy and efficient cataloging methods, adapted to an automatic business-machine installation.

The procedure for obtaining maintenance information is uniform in all refineries. A work-order system forms the basis. The use of any labor or material requires a written request. This request is made on prepared forms. Each request has three important elements:

1. An identifying number, called the "work-order number."
2. A detailed description of the job requested.
3. The signature of an authorized requester.

After preparation and authorization of the written request and copies, they are forwarded to a central maintenance-department office. There the request is reviewed. The materials, crafts, and man-hours necessary for the task are estimated. On large jobs, field engineers assist with this step. Provision for the work is made in the man-hour schedule. One copy of the request is then sent to the accounting office as notice that labor and material costs will be charged to it. A clerk adds the appropriate accounting-division numbers to this copy.

Labor and material costs for the specific task are accumulated at desired periodic intervals. The number of man-hours spent by each craft, the number of overtime hours, etc., are tabulated, and they become the basis for numerous control reports.

Each month the costs for each refinery account and subdivision are totaled. These amounts are compared with previous months, and with the average of months in previous years.

The second report, of value to plant managers, assistant managers, and mechanical superintendents, involves mechanical man-hours used. These are shown for each operating unit, and a further breakdown shows the number for each craft. It is of particular value in studying and comparing maintenance costs and time spent on individual units and processes. It helps to determine the work load by areas of the plant.

TABLE 2—WAREHOUSE INVENTORY—MATERIAL TURNOVER

"B" Refinery — Date: Aug. 31, 1948

Item—	Size (in.)	Unit	Code	April	May	June	Total usage	Inventory 8-31-48
Insulation BH-1 plastic	..	Lb.	131576	....	104	100	204	75
Pine, white	1x8	Ft.	150531	...	465	249	714	759
Elbows 45D B.M.	2	Ea.	201909	24	18	18	60	54
Schedule 40 pipe	2	Ft.	304001	180	240	980	1,400	760
	4	Ft.	304002	340	510	811	1,661	1,030
	6	Ft.	304003	1,090	980	960	3,030	2,570
Schedule 80 pipe	2	Ft.	304011	210	290	740	1,240	860
	4	Ft.	304012	410	680	1,050	2,140	1,040
	6	Ft.	304013	1,280	1,620	2,260	5,160	2,900

The actual hours required for particular representative operations can be secured. This information makes more accurate the preparation of schedules for the next shutdown. It contributes to a better job of planning and scheduling of activities.

As a further aid to controlling maintenance, a monthly incomplete work-order listing is made. At a glance, it is possible to determine whether work is accumulating, or if the backlog is only normal. It points to incomplete jobs which are allowed to drag. They just do not "hang fire" for several months when subjected to a listing and periodic review. The reviewer's attention is also directed to the reasons for a job delay.

Blanket Work-Order Costs

Some work in refineries consist of minor tasks on which individual costs would not be significant. More clerical and paper work would be required to record such costs than the individual amounts merit. For example, checking and inspecting control instruments in the plant may total a thousand different jobs. No advantage is gained by a separate work order written and processed for each. Instead, a work order is written to check and inspect all control instruments in each account division.

For example, the order says: "Check and inspect all control instruments at the alkylation unit." This order remains effective for a period of time, ordinarily 3 months, to cover the preventive-maintenance schedule on this unit's control instruments during that period. Periodically the costs accumulating against such work orders are reported and reviewed. Large amounts which are out of line with normal experience are investigated in detail.

Twice a month a list of completed job orders is prepared. Foremen receive copies showing the cost of labor and materials of individual jobs. Costs which are out of line with estimated amounts are checked. Poor planning of the work and inadequate supervision have been primary causes. Review and examination of these reports help the supervisors to follow their work more closely and to do it more economically.

In all our refineries we attempt to keep overtime man-hours to a minimum. As a check on the success of this effort, a list of overtime hours by crafts is prepared weekly. Attention is thus directed to unbalanced work forces, poor planning, and to crafts needing additional man-power. When a particular craft continually runs a high percentage of overtime hours, an investigation is made to determine the cause, and the necessary correction is made.

Cost Reports of Estimates

Also important is the control of specific appropriations of money made by the company management. Most companies require top-level approval of expenditures over a certain amount. Our company calls these projects "estimates." It is important that the amount allocated is not exceeded; hence, periodic progress reports on these estimates are essential for management control. Current labor expended to date on each job is shown. Trends to overexpend the amount appropriated serve to give advance notice to management for supplemental appropriations, or revision, or cancellation of the project.

Inventory Control Report

A final type of report is shown in Table 2. We are experimenting with reporting material inventory on the new business machines. At present our refinery storehouses manually post material receipts and disbursements. Such records are kept on a card system. To determine advantages and disadvantages of preparing inventory reports on business machines, the form shown in the example is used in one refinery. We have not yet decided on the merits of this procedure.

BOOKS

CONCISE CHEMICAL AND TECHNICAL DICTIONARY. Edited by H. Bennett. Published by Chemical Publishing Co., Inc., Brooklyn. $10.

About 50,000 definitions are included in this volume, which covers every field of scientific and technical development. Written for both professionals and laymen, it contains a great many internationally accepted terms which facilitate mutual understanding between the scientist and technical worker of many countries. Practical and easy to use, the nomenclature is that generally adopted by the chemist and engineer. Thousands of helpful crossreferences are included, and so arranged that the desired terms can be located with a minimum of effort. An addenda in the back of the dictionary lists the newest trade names and definitions. A special feature is an up-to-date compilation of trade-name or propriety products in the synthetic resin, plastics, metal, rubber, textile, food, pharmaceutical, paint, and varnish fields.

Specific Problems

Methods of Attacking for Best Success

*by R. W. Tryon**

THE maintenance problems which exist in petroleum refineries are usually quite similar, but there are sometimes wide differences in the way the problems are attacked and in the success which is achieved. This is particularly true of preventive maintenance, which might be defined as any system or procedure which, in recognition of a possible failure, attempts to alleviate its cause. Thus the training of operators in the proper handling of their equipment, the training of mechanics in the performance of their trades, and the application of highly specialized knowledge in the field of design and maintenance, all come within the scope of preventive maintenance. This report deals largely with the preventive-maintenance programs which have been developed in Esso Standard's refineries to maintain good service factor on machines.

Training Programs

Process training for operators.—Sometimes this training is started when the ground is broken for a new unit, and it continues throughout the construction period. Classroom instruction in the theory of the process is conducted by process engineers. Key operators are sent as observers to another plant where the process is in use; particular attention is paid to the details of starting up and shutting down the equipment. As the construction work proceeds, groups of operators visit the site to trace the lines and circuits and to see the interior of the equipment.

During the initial startup it is customary to have on hand operating experts from other plants where the process is already in operation. These steps, although organized primarily to insure the safety and success of the operation, are a part of the broad concept of preventive maintenance.

Preventive-maintenance course for operators.—This includes an equipment setup which has been used very successfully for training operators in the proper running of pumps. By the use of an ammeter, flow meters, pressure gages, and the display of broken parts taken from other pumps it is possible to demonstrate the do's and don'ts of starting up, shutting down, and operating centrifugal and reciprocating pumps.

Craft-training programs.—These are now in effect to develop more first-class mechanics. In the case of machinists, for example, a dual program of shop instruction and classroom study has been set up. This course advances through four phases as follows:

Classification—	Shop program	Study program
Helper	9 months	39 hours
Machine operator	12 months	52 hours
Machinist third-class	12 months	52 hours
Machinist second-class	15 months	65 hours

Each candidate for first-class machinists must meet these successive requirements in order to become a first-class machinist. The shop program starts with nine months' minimum experience as a helper; advances through experience on saws, lathes, milling machines and, finally, to precise operations on specific machinery such as centrifugal pumps, turbines, gas engines, and compressors. The study program starts with free-hand lettering; covers necessary phases of mathematics; and eventually covers the figuring of gears, lectures on metallurgy, and descriptions of the design and functioning of machinery. The study program is given on company time; instructors are made available, outside of regular working hours, to those who have difficulty with the academic studies.

Equipment-Lubrication Responsibility

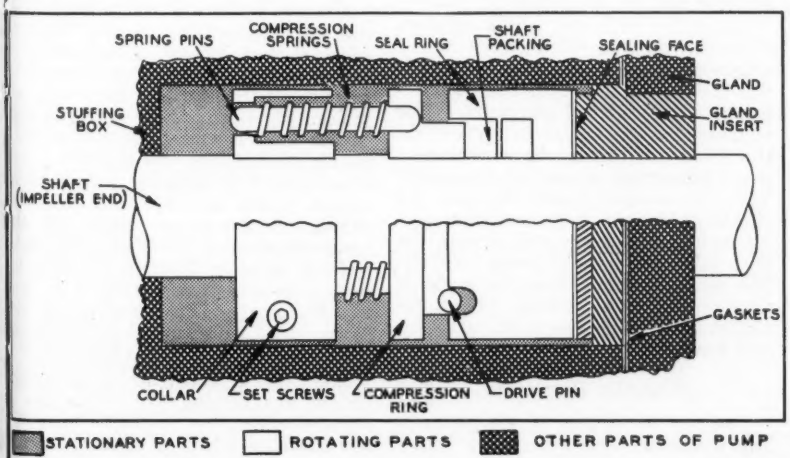
The question as to who should do the lubrication of the various types of equipment is often troublesome. For example, a case may be cited when an appreciable part of the work of an electrical department came from motor-bearing failures which were attributed to overgreasing on the part of the machinists. In many instances the casings and windings of these motors were found to be covered with grease.

The first step in the program has been the preparation of a lubrication manual for each operating unit, of which 65 are involved. One of the prime purposes of this manual is to clearly define the responsibility for every lubrication requirement on the unit.

Pumps and Drivers

Esso Standard's larger refineries are equipped with 4,000 to 5,000 pumps of both centrifugal and reciprocating types. Although the keeping of machinery records is important in a refinery of any size, the records of so large a proving ground provide a valuable preventive-maintenance tool. The pump records are usually kept by a group attached to the machinist division, which also maintains records on all other refinery machinery and heat exchangers.

The pumps in a fixed area are assigned to a field machinist, who visits all operating pumps daily to check packing condition; also to check noise or bearing-temperature indications. All repair work performed is



A typical mechanical seal used to replace conventional stuffing box on centrifugal pumps. Seal is applicable to standard stuffing boxes, and it can be modified for external assembly

*Esso Standard Oil Co., New York. Summarization of paper given at midyear meeting of A.P.I. Division of Refining, Houston.

noted on a slip which is sent to the pump-records department. One refinery circulates a "morning report" covering the 24-hour status of pump and machinery difficulties throughout the refinery.

The refinery-loss reduction program has stimulated better maintenance on pumps by means of a procedure to measure and record pump-gland leakage. Over a 3-year period these records show that average gland leakage has been reduced 30 per cent.

In considering the problem of leakage from centrifugal pumps, it appears that it is difficult to eliminate entirely leakage at the stuffing-box with conventional packing. This becomes more critical when the fluid being pumped has no inherent lubricating qualities and when the fluids pumped are capable of actually dissolving the lubricants in the packing. A newer development, which is gaining prestige in preventive maintenance, is the mechanical seal. (See Fig. 1).

So far mechanical seals are widely used only on light-products pumps where the elimination of seal oil, packing trouble, and product degradation shows an annual payout in excess of 100 per cent.

The highest pressure and temperature where mechanical seals are now used in Esso Standard's refineries are 315 psig. and 275° F. respectively.

The seals referred to previously are single mechanical seals. Double mechanical seals have been in use for a much longer period; and, although they give satisfactory service, a seal-oil system is required. There have been occasions when the inside seal has failed, and when this circumstance was not detected by the operating personnel for some time.

Testing and Rebuilding Pumps

Although not a widespread practice, there is a movement under way to check the performance of key pumps at 6-month intervals in the field. This gives indications of the internal deterioration of the pump, and permits a scheduled overhaul before it breaks down completely.

Most operating unit pumps are opened for inspection during major turnarounds. If there is any question about the condition of the pump, it is sent to the shop, and is rebuilt as required. One of the items which is being checked on all light-ends centrifugal pumps throughout the company is the condition of drain connections. At least one or two instances have occurred in the past when the wash of the liquid has, by erosion and corrosion, removed most of the threads on the drain plug.

Motors and Electrical Equipment

Esso Standard's larger refineries contain as many as 5,000 electric motors. Those on operating units are checked during general inspection turnarounds. This inspection includes the measuring of insulation value of feeders and motor windings; the checking of relay settings; also the checking of starter and lubrication. In checking the insulation value, 5 megohms is taken as an indication of trouble, and 1 megohm is considered critical and will warrant sending the motor to the shop for dismantling.

On all large operating units the motors are taken to the shop for overhauling at intervals from one to two years. The windings are washed with Varsol (solvent naphtha), baked, and varnished.

In areas where lightning storms are prevalent approximately 25 per cent of all motor failures are due to this cause, and lightning protection for the feeder systems is being extended.

Turbines

Most of the turbine drivers in Esso Standard's refineries are on spare pumps. A check made at 4-month intervals involves "breaking" couplings, running up to speed, and establishing the revolutions per minute at which trip mechanism functions.

Compressors

The use of gas-engine-driven compressors has developed to such a point that their importance to throughput has required a systematic maintenance approach. One refinery, for example, has 153 units ranging from 124 to 800-hp. in size. The inspection and maintenance of these units require a force of 24 machinists and helpers, although a smaller group would suffice if all machines were of improved modern design. This distinction is indicated by the fact that the overhaul schedule has been set at 3,000 hours for the older horizontal machines, whereas a 10,000-hour overhaul schedule applies on a modern angle and V-type machines.

All units are checked on a 1,000-hour schedule. The scheduled overhaul involves complete dismantling and replacement of necessary parts, such as piston rings and valves.

In another refinery, which employs a smaller number of compressors and where most compressors are of modern design, an 18-month overhaul interval is considered optimum. This refinery has an engine-test group in the field which checks compressor performance on a rotating schedule. The work of this group involves the checking of ignition systems, the taking of indicator cards, and setting the best schedule on clearance pockets. The work of this group has made it possible to develop some spare capacity, permitting the shutting down of a few units.

Cathodic Protection

Cathodic protection in Esso Standard refineries started only 2 years ago. The practice today is to install most pipe on overhead supports, and to relocate piping aboveground on a program basis. However, the latter program is expensive, and cathodic protection is being demonstrated as competitive in some instances. A typical payout is 3 years in one refinery where soil conditions are quite corrosive.

Two types of anodes have been employed to protect piping in buried trenches. The early type employed scrap steel imbedded in gypsum and sand. The installations were made by drilling holes at 20-ft. intervals on both sides of the trench. Discarded pipe, in lengths of 8 to 10 ft. in sizes up to 8-in., were placed in these holes and they were of sufficient weight to provide about 15 years of service life. Recent installations use carbon anodes, which are vertically installed in a soil boring, and are surround by coke. These anodes are 2½ in. in diameter and 60 in. in length.

In some areas there have been no leaks during the 2 years since the installation of cathodic protection. In other areas leakage has been greatly reduced. Statistical data are being accumulated which ultimately will determine the desirability of extending this form of protection to other piping systems.

Cathodic protection is strongly favored for spheroids which carry light products—where the bottom is in contact with corrosive soil. Horizontal anodes, consisting of two 12-in. pipes or three 8-in. pipes buried 5 ft. deep, are used for tank protection. One 10-volt 100-amp. rectifier unit will protect three spheriods.

Cathodic protection is also undergoing experimental trial for the protection of open-box-type coolers as well as for shell-and-tube coolers. A trial installation is also being made on water wells, where the casings have been deteriorating rapidly and where the expense of pulling and renewing these casings has been excessive.

Nonmetallic Linings for Large Vessels

Gunite has been found to provide one of the most successful methods of protecting storage tanks from internal corrosion, but the application of gunite is not favored for badly deteriorated tanks because the strength of the tank to carry the gunite must be considered and this method is not a cure-all for stopping leaks. Reinforced gunite is now definitely favored, inasmuch as some of the early unreinforced installations have spalled. In making an installation today, a thorough inspection of a tank is first made. Consideration of the past and future services, and of maintenance-cost history, is reviewed.

The type of construction now employed for erosion protection has a metal-mesh base which provides pockets into which a special cement lining is gunited. The liner serves the dual purpose of providing erosion protection and internal insulation.

Scheduling—

Achieves better efficiency of labor

*by H. H. Linnell**

TWO-THIRDS or more of the refinery-maintenance dollar is now spent for labor. If the maximum return for maintenance and expenditure is expected, sufficient thought must be given to planning the use of this labor to obtain the highest output with a minimum of wasted time and effort.

After the planning has been done, the proper information must be transmitted to the supervisors and workmen assigned to the job—in time to enable each to perform his part intelligently. This is fundamental to any effective system of scheduling work, and is accomplished in our plant by a daily scheduling procedure which, in general, requires that all maintenance work which must be done the following day shall be listed.

The procedure specifies that the number of men required be balanced with the number available; and that the supervisors shall be informed in time to allow them to develop any detailed knowledge of the work they need and to select and instruct their men. This procedure also allows the supervisors time to arrange for material, tools, and equipment deliveries in advance of the time the men report to the job.

The system was started more than 20 years ago when, as the strength of our maintenance forces grew to take care of an expanding plant, the need of a better scheduling procedure became evident. With changes made from time to time to effect improvements in its operation, essentially the same system is being used today.

*The Texas Co., Port Arthur, Tex. Paper presented at Houston meeting of A.P.I. Division of Refining, April 7.

Long-Range Planning

Day-to-day planning and scheduling are guided by regular annual, semiannual, monthly, and weekly surveys of our manpower requirements.

The annual forecast, made for budgeting expenditures, gives the long-range picture of the construction and maintenance work planned for the year, as well as the manpower needed to accomplish it in terms of over-all forces. It is based on the refinery production schedule which outlines what equipment will operate, and over what periods of times, as well as on the anticipated major investment work to be undertaken. This budgetary forecast is used only as a general outline of the work ahead.

The semiannual labor forecast is prepared quarterly, and covers an estimate of the labor requirements for the next two quarters. In preparing this forecast, the number of employes from each craft needed daily, under the following captions, is estimated:

1. Overhead and supervision.
2. Maintenance. (a) Routine maintenance. (b) Miscellaneous maintenance. (c) Other maintenance.
3. Inspection and testing of process units.
4. Construction and major expense items.

Maintenance work is divided under three captions for analytical purposes, as follows:

Routine maintenance includes routine running repairs and preventive maintenance work that requires fixed numbers of men on the same assignments day after day, the year round.

Miscellaneous maintenance covers shops and some field labor used on such work as the manufacture or recovery of material, the operation of trucks assigned to the various departments, etc., on which about the same number of men is used daily.

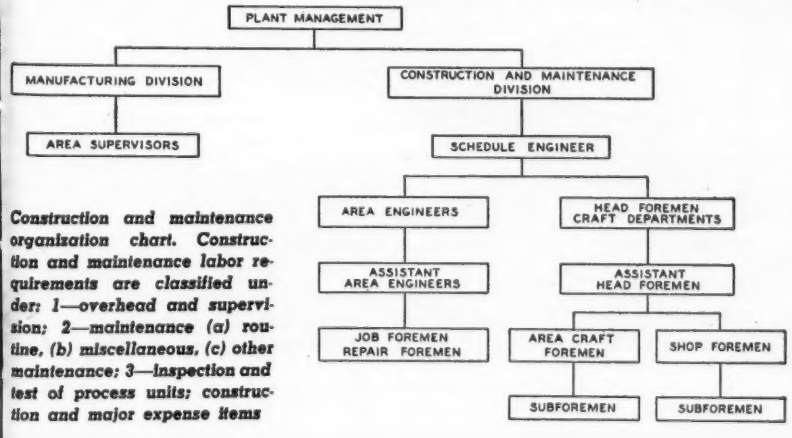
Other maintenance in this category are placed forces used on painting, cleaning, and repairs to exchangers and tankage; repairs to lines, pumps, and other equipment; and all other repair work not considered routine nor handled by the routine repair men.

Labor requirements for routine and miscellaneous maintenance, turnarounds of process units, construction, and some major expense items, as well as supervision and overhead, can be forecasted fairly accurately. Figures used for other maintenance are largely governed by past experience, along with any knowledge of definite work to be done under this caption. The daily totals added to the number estimated to be absent (for various reasons) indicate the necessary strength of each department in the construction and maintenance division.

The demand for maintenance forces is kept as uniform as possible by careful timing of unit shutdowns, and by fitting the construction and major expense work into the planning as maintenance forces are available from turnarounds and the more important maintenance work needed to keep production units in operation.

Stability of plant construction and maintenance forces is also obtained by the use of contractors' forces on major replacement and new investment items wherever such work cannot be fitted into the program of work which can be performed by company labor. The 6-month forecast gives us a rather accurate picture of the work ahead, and serves as the control for the monthly and weekly labor forecasts for the outlining of work to be done.

Labor forecasts are made monthly to furnish a detailed picture of the work to be carried out during the month ahead. This enables us to plan for many of the revisions that must be made to the longer forecasts because of changes in operating requirements, because of the need of taking



Construction and maintenance organization chart. Construction and maintenance labor requirements are classified under: 1—overhead and supervision; 2—maintenance (a) routine, (b) miscellaneous, (c) other maintenance; 3—inspection and test of process units; construction and major expense items

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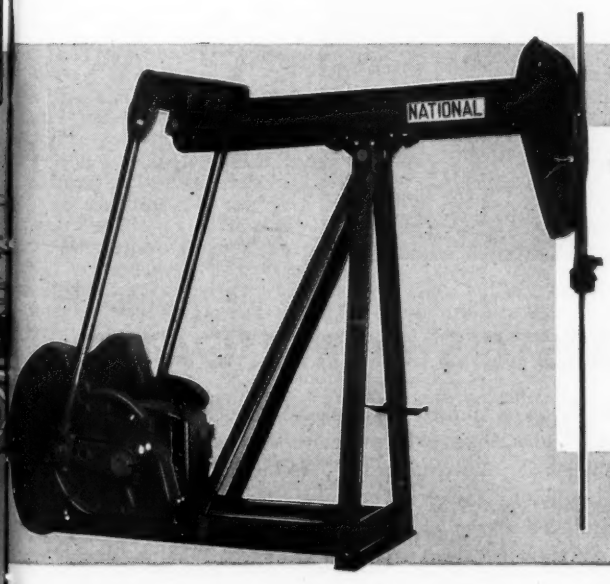
And if you're wondering about performance, just talk to any lease man. He'll quickly tell you that National Pumping Units are trouble-free...that they'll pump day in and day out without interruption. Write for descriptive bulletins that describe the design and construction of the complete National Pumping Unit line.



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D-4	4100	10000
D-5	5200	16000
D-7	6500	25000
D-9	8900	40000
D-11	11000	57000
D-13	12750	80000
D-15	15000	114000
D-21	20700	160000
D-24	24150	228000
D-29	29000	320000
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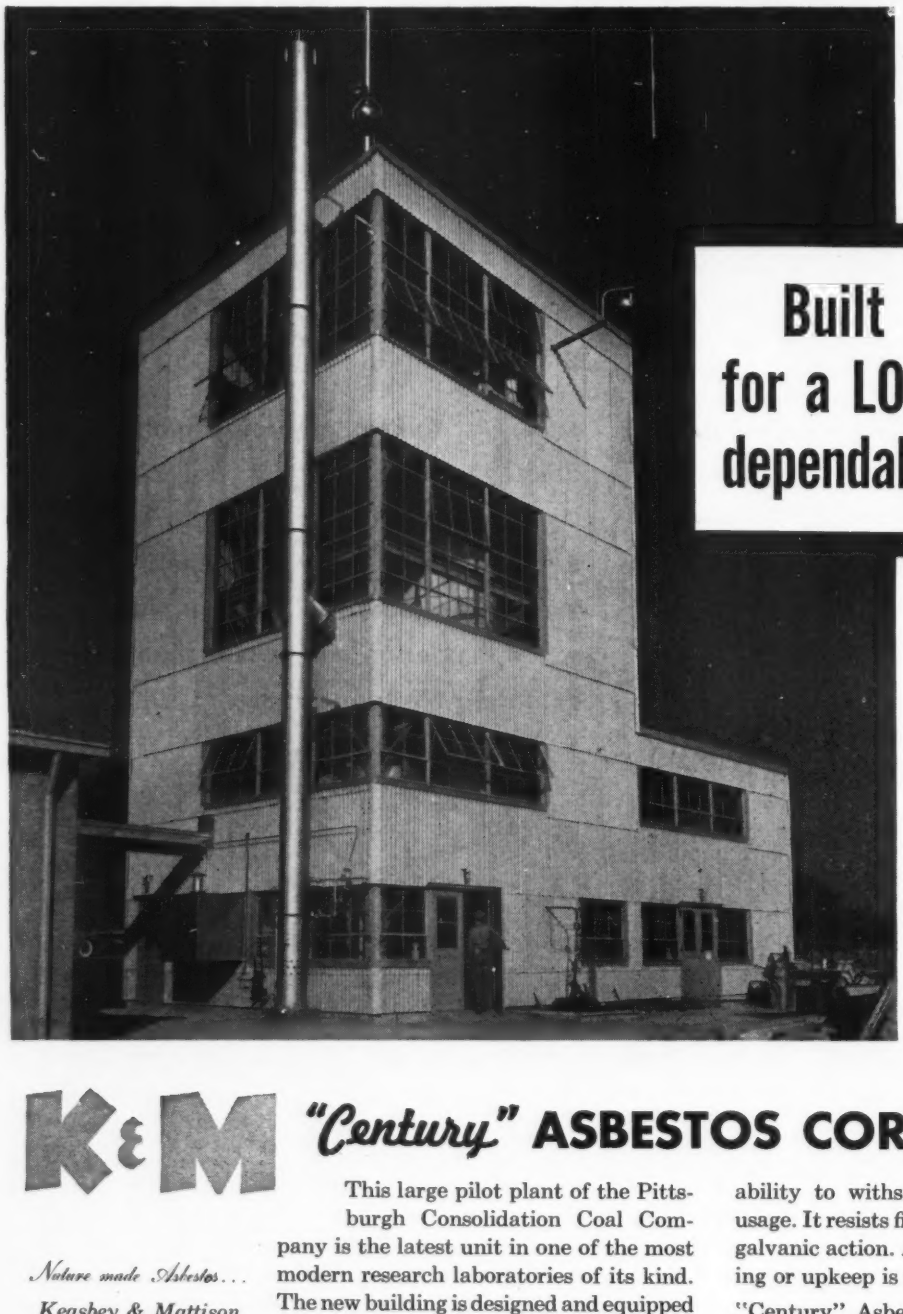

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units out of operation for cleaning and repairs that could not be foreseen or definitely fixed in the overall planning, because of inaccurate estimates of time required to perform scheduled jobs, and because of emergencies and other factors that disrupt the long-range planning.

In making up a monthly forecast, each department in the refinery requiring maintenance work submits an estimate of the man-hours for each craft that will be needed. The total is balanced with available manpower in a monthly meeting of the general superintendent and the department heads; and, if necessary, work is cancelled or deferred to take care of worker shortages. Overages are infrequent, inasmuch as total forces are kept low to insure a sufficient backlog to avoid layoffs or transfers. Minor differences in labor demand and supply are ignored, and are left for the daily scheduling.

The primary purpose of the monthly forecast is to acquaint all concerned with the work to be done the following month so that all departmental and area planning will conform to the approved forecast.

Day-to-Day Scheduling

The daily scheduling procedure may be divided into three steps:

1. Estimates of the next day's manpower requirements made up or assembled by each area engineer.
2. Balancing of such requirements with the forces available for performing the work by the schedule engineer.
3. Assignment and instruction of gang leaders and workmen by supervision of each department in the construction and maintenance division.

Although this system is adaptable to the maintenance work of larger or smaller plants, a description of it may be clearer if some details are given concerning the manner in which it functions in our refinery.

Port Arthur Works, The Texas Co.'s largest plant, is classified as a complete petroleum refinery. There are some 5,500 employes in this plant, of whom approximately a third make up the construction and maintenance division. In addition to all maintenance, this division is in charge of all construction, a considerable portion of which is handled by company employes.

The plant is divided, for administrative purposes, into three zones or areas, in each of which all maintenance and construction (with the exception of major construction projects) is headed up by an area engineer. Major construction work is usually placed in charge of construction engineers who are responsible for the scheduling of any construction-and-maintenance division forces required.

This division has 14 craft and shop departments, and approximately one-half of the manpower in these departments is covered in the daily scheduling. The nonscheduled manpower is made up of shop, clerical, and supervisory forces and employes absent, on light duty, and temporarily transferred to other departments in the plant.

Two departments consist wholly of shop or routine employes not included in the scheduling. Field forces of the other 12 departments are all scheduled daily; and, with the exception of those in one small department which is supervised directly by the head foreman, these are supervised by area craft foremen and subforemen under the head foreman and assistant head foreman of their respective departments.

Each area craft foreman works closely with his area engineer, and carries out the latter's planning. Direct responsibility for supervising the men and accomplishing the scheduled work rests on the head foreman of each department.

The area engineers, together with their assistants, including their job or repair foremen, are required to schedule all planned maintenance and construction; to assign work of an emergency character to the proper craft departmental foremen; and to coordinate the work of the various crafts in their areas.

Weekly Forecasts

To supplement the daily schedule, a labor balance is made about the middle of each week by the schedule engineer, which covers the work to be undertaken during the following week. Estimates of the forces required from eight craft departments are made by each area engineer, and the average daily force is worked out by the schedule engineer. The available scheduling strength of these departments (carpenters, insulators, masons, machinists, pipefitters, riggers, laborers, and welders) usually controls the work programs. The week's work is then approximately adjusted to the number of men available by deferring less urgently needed work or by advancing work originally planned to be done later. Frequently substantial overages and underages of strength in the eight departments can be balanced by planning the transfer of helpers from one department to the other on loan.

This weekly forecast is studied by the superintendent of the manufacturing division and his staff, and his agreement is obtained for any changes to be made from any previous plans. The priority to be given the various jobs from the standpoint of production requirements is then assigned. The weekly forecast is not distributed to the craft departments, but serves to give operating supervisors sufficient time to plan shutdowns of process units, clean and prepare lines and tanks for repairs or replacements, and to take any other necessary steps to coordinate the planning of both divisions.

The area engineers and the schedule engineer schedule the daily work in conformance with the weekly forecast after necessary changes have been made. The forecast also furnishes the basis for making up the weekly postings of day employes who are to work "shift" hours the following week. As in the daily scheduling, it covers a 5-day week. All week-end work, which usually involves some 60 employes per day, is scheduled on Friday, at which time the schedule for the following Monday is made.

Major Job Scheduling

Practically all processing units are brought down to be inspected and tested at approximately 6-month intervals, or multiples thereof—not only as a safety measure, but also to allow a balanced force to be maintained. Unless the inspection periods are scheduled in this way, either much larger maintenance forces will be needed to work a number of units simultaneously, or the down periods, in many instances, will have to be extended because of insufficient manpower.

Also, a periodic and thorough overhauling brings to light much repair work which otherwise might have resulted in much more costly repairs had the units been continued in operation. Even if repairs or replacements are not immediately necesary, the inspection—together with past performance records—allows us to predict more accurately when these will be needed.

The long-range planning for the turnaround work usually starts when the 6-month labor forecasts are prepared. A 6-month test schedule is made up about 6 weeks before the start of each semiannual period. This schedule gives the dates fixed for taking each unit out of operation and the number of days it is to be down.

For high-pressure units the operating interval between inspections is rigidly held to a maximum of 6 months. On most other units some tolerance is permitted in order to facilitate adjusting the schedule so as to allow for holding the manpower requirements to as uniform a basis as possible.

Other factors which govern the choice of shutdown date for each unit are the general condition of the unit, the necessity of meeting production requirements, and the anticipated time of receiving materials needed for major replacements or repairs. The 6-month test schedule is referred to whenever each monthly labor forecast is prepared. As far as possible, units are brought down on the scheduled dates, although some shifting may be necessary because of unforeseen conditions.

On most of the older units, particularly those requiring small maintenance forces, the turnaround procedure has become well established, and is now more or less routine. Accordingly, unless unusual work is

(Continued on page 100)

Exploring Engine Cleanlines

Single-cylinder engine test method, developed by Ethy Laboratories, offers refiners economical tool for study ing complex problems of varnish and sludge deposits

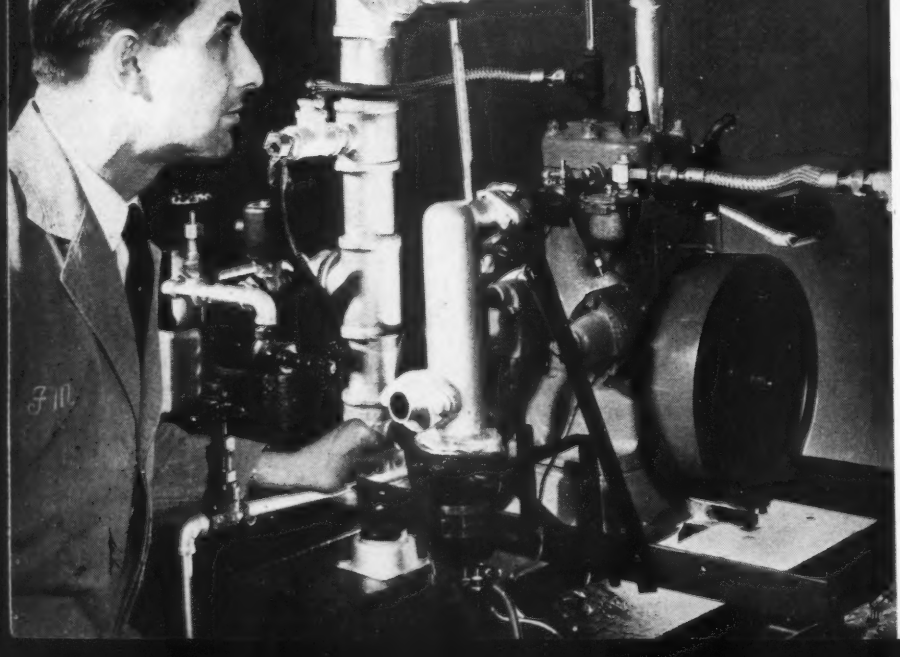
THE PROBLEM of keeping engines free from varnish and sludge deposits is not new—but it is one that is increasing both in importance and complexity as advances are made in engines, fuels and lubricants. Recognizing engine cleanliness as part of the over-all problem of engines, fuels and lubricants, the Ethyl Laboratories have worked extensively in helping to build up a background of information on the factors contributing to the formation of varnish and sludge.

A complex problem

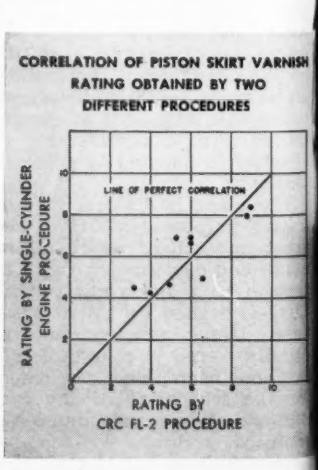
Some of the complicating factors involved in engine cleanliness are:

1. *The steadily widening range of engine operating conditions—with the extremes becoming increasingly severe.*
2. *The astronomical number of possible chemical reac tions among fuels, antiknock compounds, lubricatin oils and oil additives.*
3. *Engine design characteristics and the type of servic in which the engine is employed—both of which hav a decided effect on the amount of deposit.*

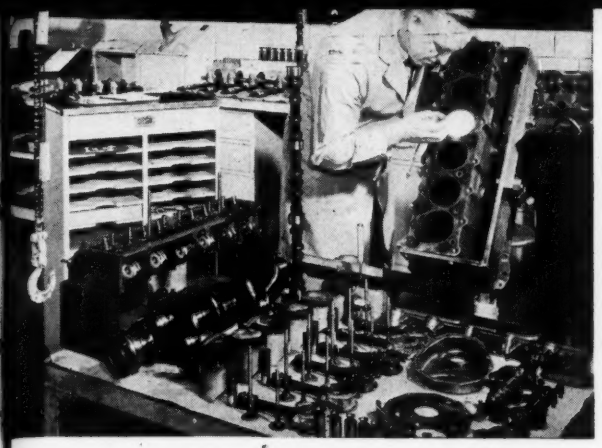
It has been known for some time that the type o lubricating oil may, under high temperature oper ating conditions, be the controlling factor in the de position of sludge and varnish. More recently it ha been demonstrated that gasolines vary in their ten dency to assist in the formation of deposits. Th greater complexity of the problem than was indicate at first accented the need for an economical tes method that could be used for screening an preliminary tests.



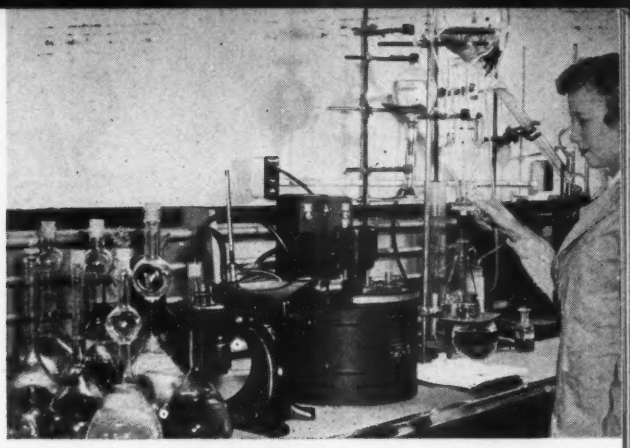
Ethyl's test method employing a single-cy inder engine provides an economical mean of evaluating varnish-forming tendencie of fuels.


CORRELATION OF PISTON SKIRT VARNISH RATING OBTAINED BY TWO DIFFERENT PROCEDURES
LINE OF PERFECT CORRELATION
RATING BY SINGLE-CYLINDER ENGINE PROCEDURE
RATING BY CRC FL-2 PROCEDURE

Cleanliness ratings of fuels obtained by single-cylinder engine test method correla satisfactorily with those obtained by mu cylinder engine test method.



After the CRC multicylinder engine test has been completed, detailed inspections are made and engine cleanliness ratings assigned to the various parts.



In the Ethyl Chemical Laboratory gasoline is analyzed to determine hydrocarbon type as a basis for study of engine cleanliness as related to composition of fuel.

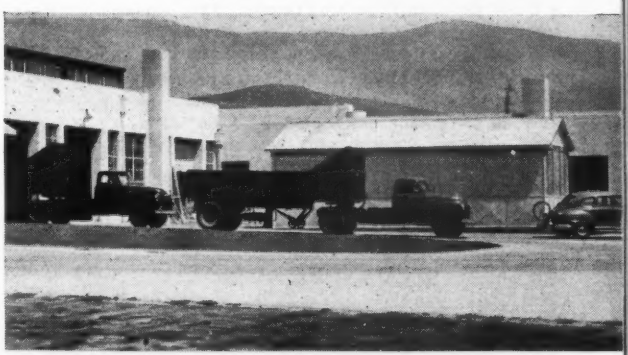
An economical test procedure

An important contribution of Ethyl's research has been the development of a test method that permits many of the studies formerly carried out on multicylinder engines to be made on a small single-cylinder engine without expensive dynamometer and associated equipment.

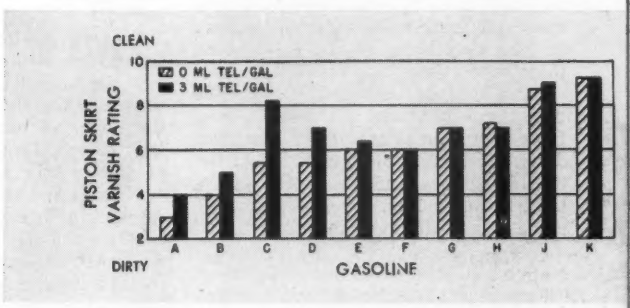
The smaller single-cylinder engine uses only 14 gallons of fuel per test run—compared to 180 gallons for the multicylinder engine; thus engine cleanliness ratings can be obtained on small samples of experimental fuels.

Research related to engine cleanliness is only one of the many services provided by the Ethyl Laboratories for oil companies. A comprehensive and continuous research program provides information that assists refiners directly in the economical production of satisfactory gasoline and furnishes basic data which serve as a foundation for development work related to gasolines, engines, and crankcase oils.

This message is the thirteenth in a series dealing with problems faced by refiners in producing gasoline for today's and tomorrow's engines, and the contribution of the Ethyl Corporation to their solution. Future messages will discuss other phases of this complex problem.



Wide ranges of weather and topography near Ethyl's San Bernardino Laboratory are ideal for vehicular research on engine cleanliness.



Research on ten different fuels showed that the addition of "Ethyl" antiknock compound tended to reduce varnish deposits on piston skirts.

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Shops—

The Layout and the Tooling

by Ditmas Bromley and Henry P. Evans**

LET'S take a look at the maintenance shops in the usual refinery. Invariably we see these shops in many small buildings—buildings not designed to house shops; buildings scattered throughout the refinery. Now let's look closer at these shops.

First we'll look at the layout. The scattered buildings usually have no planned arrangement. And when we do find several shops in one building, they're partitioned off. Thus, in effect, they, too, are separate buildings. What does this separating and scattering of shops do to the flow of work? It slows down the flow. And it takes a lot of handling to maintain even this slow flow. Scattering and separating maintenance shops violates every fundamental principle of American industry.

Now look at the machine tools. They are not modern. Many of them have worked 20 years or more. They're obsolete and worn out. They are unfit for today's work. They have justly earned their retirement. But they are not retired. Instead we see these machine tools struggling away at jobs that have grown far beyond their reach.

Let's look at the usual stores. We find them scattered all over the refinery: in open areas; in hand me down sheds left over from construction days; in abandoned units; in the tank farm. In fact, we find them any place where the storekeeper can find room to set them down—even if it's only for today, for tomorrow they may have to be moved.

Scores of other things are vital to maintenance besides the shops and the stores. There must be tools for handling the apparatus at a unit. There must be proper tools for hauling, from unit to shop and back again. What tools are we talking about? Why we are talking about built-in air hoists, fork-lift trucks, cranes, and handling equipment of all sorts; trucks and trailers; and, finally, good roads.

Now what do we find in the usual refinery for this handling and hauling? If we find anything at all, it's a trolley hung on the monorail. But no hoist—that's probably in storage. If we look for fork-lift trucks, we find none. When we do find a crane, it's usually too small or worn out and, therefore, seldom used. As for hauling, we usually find a few old, light trucks creeping along on roads that are narrow, twisted, and unpaved.

We see pretty clearly that some things are wrong in the usual refinery: the layout and the tooling of the maintenance shops; the stores setup; the lack of mobile equipment; the lack of handling equipment; the lack of good roads; and other things, too.

What is the result of these wrongs? A quick glance at the cost books tells the story. They show that, of all the wage people, one-half are working on maintenance. A refinery charging 80,000 bbl. per day will have same 1,200 wage employes, and 600 of them will be working on maintenance. This maintenance labor costs plenty. When we add in the so-called overhead, it amounts to some $6,000 a year per man. For these 600 men, the cost of maintenance labor alone is well over $3,000,000 a year.

But the cost books also tell us that other money is going down the drain. Units are offstream longer than they need be, because both turnarounds and emergency repairs are too slow. This extra downtime costs real dough. For an 80,000-bbl. refinery, each day of downtime cuts net income $60,000 or more.

Some of us have had experience in construction and maintenance in refineries and in other industries. From this experience we have developed certain principles—principles that have stood the test of time. And we have found that, if these principles are properly applied savings are enormous.

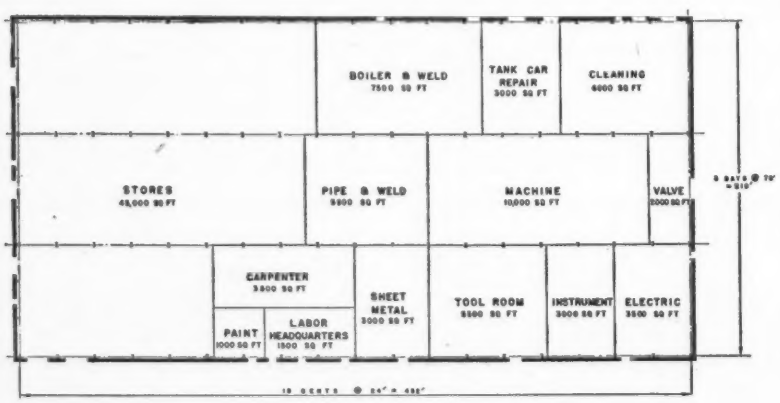
The Principles

Centralize the facilities.—Bring together, into one central area, all of the facilities that properly belong together: craft shops, headquarters for field crafts, stores, cleaning facilities, garage, offices. This centralizing helps in several ways. It reduces and it simplifies the handling. It improves supervision. It avoids duplication.

Combine the buildings.—Put into one building all of the craft shops, all inside stores, and the cleaning facilities. There are four good reasons for using one central building to house all of these activities, viz.: (1) A single building costs less than several smaller buildings, both in first cost and in later maintenance. (2) A single building gives greater flexibility in allotting floor space to meet ever-changing needs. (3) The common use of handling facilities by all activities makes for economy. (4) A central building gives closer coordination between all the activities, and it promotes cooperation among all the crafts.

Tool of men.—Man's horsepower is puny compared to that of a machine.

A 1-hp. motor can do the work of 30 husky men. For 8 hours of work, the motor costs 10 cents. For the same work, the men cost $700. It's hard to believe that machines can



Arrangement of the shops

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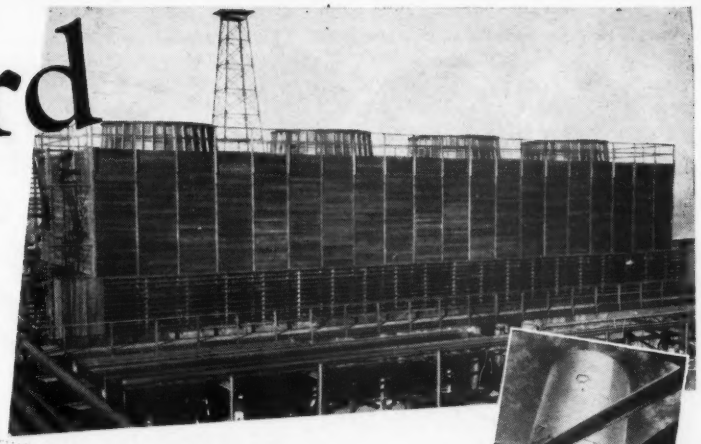

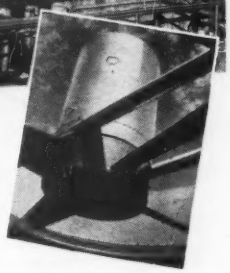

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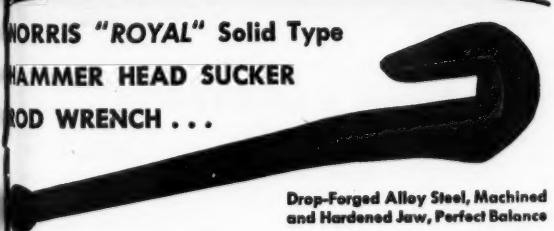

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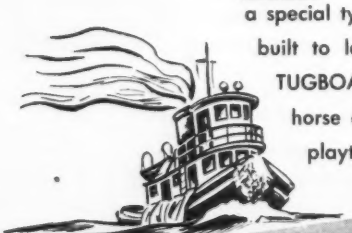

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beat men 7,000 to 1. But it's a fact. Let's not fight it. Let's provide machines wherever possible to do the physical work of men. And let's provide plenty of small power tools to help a man do his hand work. This principle applies to all men: laborers, helpers, office workers, craftsmen, supervisors, superintendents.

Tool the unit.—Here we speak of facilities added to a unit to provide better handling and better access. Many heavy things must be handled over and over again as a unit: things such as column trays, tube bundles, pumps, valves. These should always be handled by mechanical means—by power hoists, gantries, or by mobile equipment such as cranes and fork lift. Get rid of makeshift things that must be brought to the job each time—makeshift things that call for an excess of manual labor, such as rollers, skids, and cribbing. But handling equipment alone is not enough. Men must be able to get at things—quickly and easily. Platforms, stairways, and ladders that are always at the unit make access easy. And they get rid of temporary scaffolding.

Tool for hauling.—Men, materials, and equipment all need hauling. This is a job for trucks, tractors, trailers, and all sorts of mobile equipment. Good vehicles, moving on straight paved roads, shrink the size of any refinery—distance is of no importance. Hauling to any part of the refinery is rapid. Well-built roads reduce the wear and tear on mobile equipment. And they prevent costly delays in hauling during bad weather.

Train the men.—The application of these principles brings to maintenance many new tools and many new methods. To be sure that these new tools and new methods will work properly, maintenance must cast off its traditional ways— once and for all. The pattern or organization must change. Supervisors must be trained to use the new tools as they should be used. The training must reach out to the craftsmen, and to all maintenance workers.

Keep flexible. — This principle is mighty important in the work of maintenance. New methods, new tools, new processes, changing labor relations, changing work load—all of these make for ever-changing conditions; conditions that must be met by rearrangement of machine tools, by expanding the work areas, by enlarging the buildings. Thus, let's have this principle uppermost in our minds—keep flexible.

All of these principles apply to any refinery, regardless of its size. But to make their application more concrete, suppose we choose an average refinery and see how the principles work out.

This average refinery, let's say, has a daily throughput of 80,000 bbl. of crude. The units take up some 150 acres, and the tankage spreads over perhaps 200 more. The units are the usual ones: crude and rerun stills; topping units; light-ends recovery; cracking units—both thermal and catalytic; polymerization units; an asphalt plant; and a lube-oil plant. And then, too, there are the utilities. Today, in this average refinery, we see some 600 wage men working on maintenance.

Making the Layout

Let's apply our first principle to this average refinery. What do we find to centralize? There are the craft shops—the usual 12: machine, weld, pipe, boiler, electric, instrument, carpenter, valve, sheet metal, blacksmith, tank-car repair, paint. And with these, let's include the tool rooms.

Then there are those field crafts, that work out of headquarters, other than their own craftshop. In this average refinery these field crafts are laborers, insulators and riggers. And let's not forget the stores—those that are in the various buildings, and those that are in the many outdoor areas.

There are the facilities for cleaning tube bundles, pumps, valves, and the other things that maintenance works on. Next comes the garage that maintains the mobile equipment for maintenance, and for the rest of the refinery. Then there are the offices for the maintenance staff—offices for general supervisors, foremen, and clerical workers.

Now let's combine as many of these things as we can. All of the craft shops go together in one building. None of these shops work by themselves or must be kept apart for reasons of safety. So we will put them all together. And then we will go a step further. We'll gather up all that shop work now done at the units or in the field, and put this work where it belongs—in the craft shops.

Field crafts need but little shop space. But they do need room for tools and a place to headquarter. All of the field crafts—except the laborers, insulators, and riggers—work closely with their own shop craft. But what shall we do with the laborers, insulators, and riggers? Why let's give them headquarters and tool space in the same building as the craft shops.

As for the stores, we shall put the things that should store inside all together in a single building. And the things that should store outside, we shall put together in one area adjoining that building. This means that we will have one building for stores and another building for the shop. As we see it, there's no reason to separate stores from shops. But there are several good reasons to combine them.

As for the cleaning facilities, let's put them together in one cleaning area, and put that cleaning area in our central building.

The garage in our average refinery gives the mobile equipment the same complete service that a retail service station gives to the traveling public—washing, lubricating, fueling, and minor repairs. But it does not make major overhauls on any of the mobile equipment. The work of a garage like this needs no special machine tools; nor does it need many stores. For this reason, we believe the garage should not be a part of the central building. But it should be in a building of its own.

How about the offices? Where shall we put them? Certainly, the offices for the garage should be in the garage building. And then, too, the other offices should be close to their work. Thus we put offices for the stores in the stores section of the central building. The remaining offices we put in the shop section.

Now we have centralized things and combined them. What do we end up with? One central building! One garage building! And an outside area for stores! But how do we get the size of these things?

The Size

Take the central building first. To size the shop section of this building, each shop must be laid out. Before this can be done, we must know what machine tools are needed to handle all the mechanical work that comes to maintenance.

The best layout comes with a column spacing of some 70 ft. With this spacing we get a clear aisle through each bay—with machine tools ranged along both sides of the aisle. The shop-section totals some 55,000 sq. ft. of floor space.

To get some idea of the size of the stores operation, we look first at the inventory. Its dollar value is roughly $1,500,000 in this average refinery, and it turns over twice a year. Thus the store business has an annual volume of $3,000,000. The total area for stores is going to be big. This we know for sure.

Our experience in working over refinery stores tells us that our average refinery should have roughly 45,000 sq. ft. for inside stores and some 50,000 sq. ft. more for outside stores. These areas allow for offices, aisles, and roadways. Thus our central-building area is 55,000 sq. ft. for shops, plus 45,000 sq. ft. for inside stores—a total of 100,000 sq. ft. This area is ample for everything that goes into the central building.

As we go ahead with our layout of the central building, we find that our shops and stores fit nicely into three 70-ft. bays. Thus our central building is roughly 210 ft. wide by 440 ft. long (Fig. 1). The building has a rigid frame, with each of the bays

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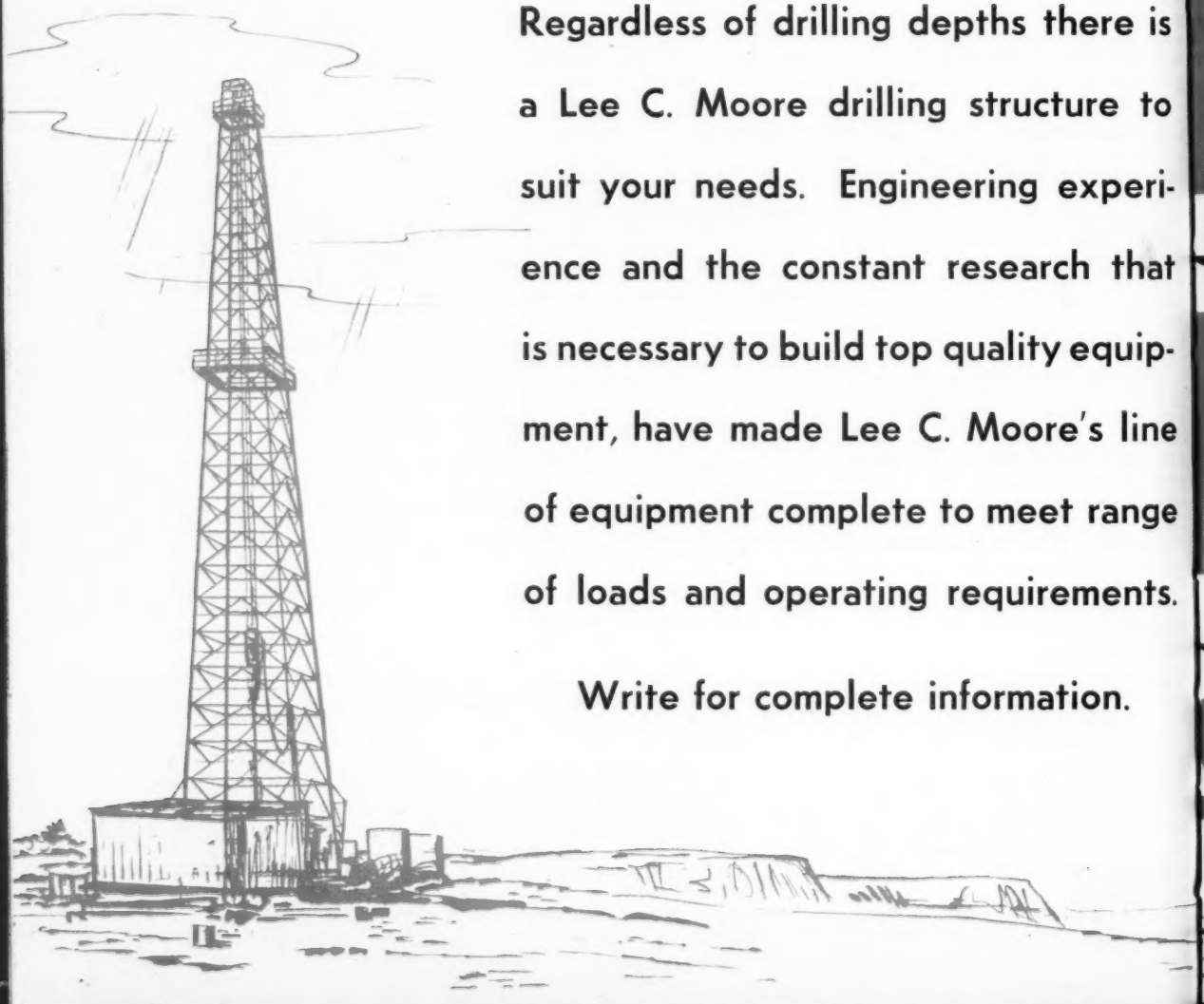

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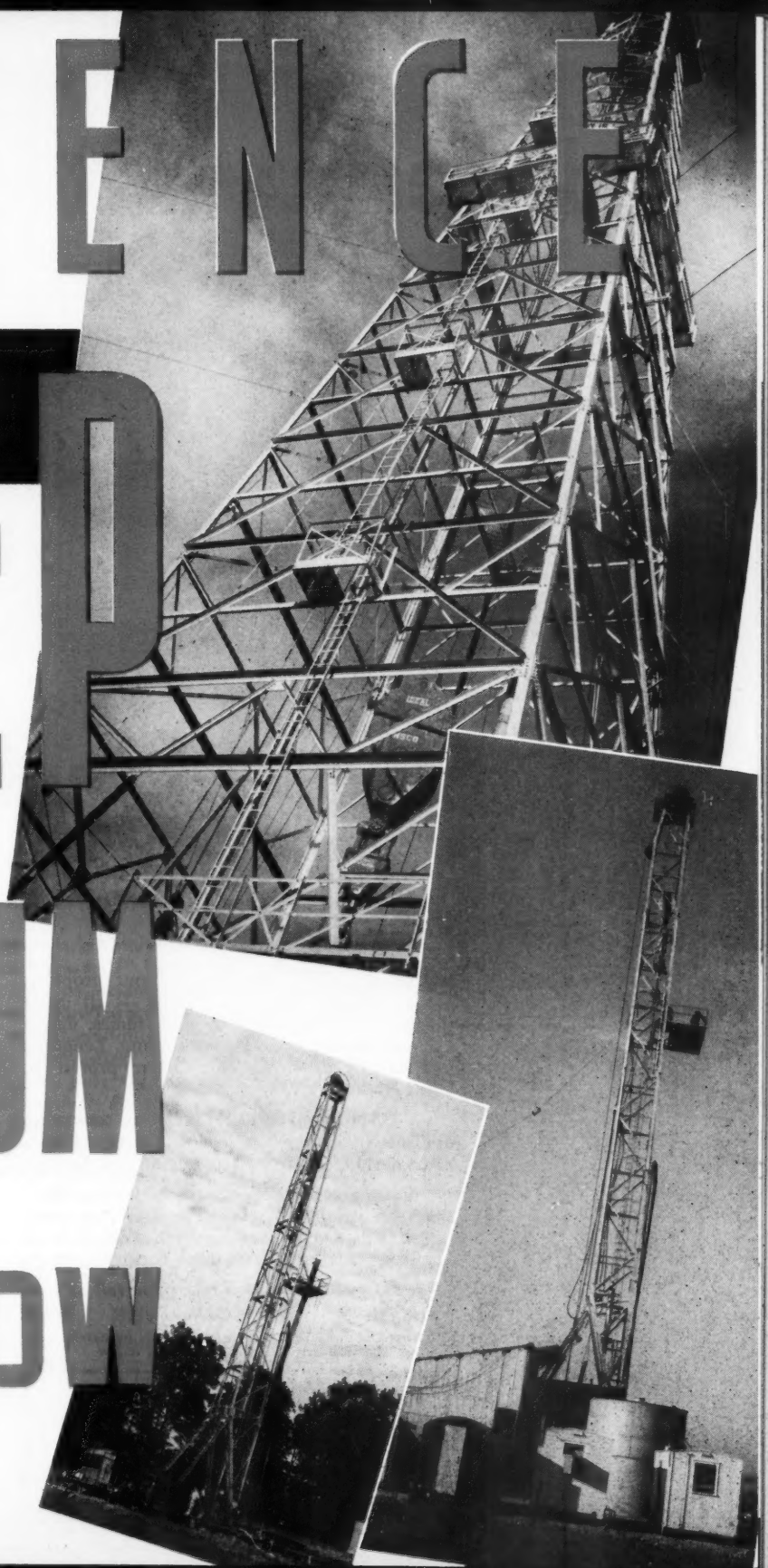

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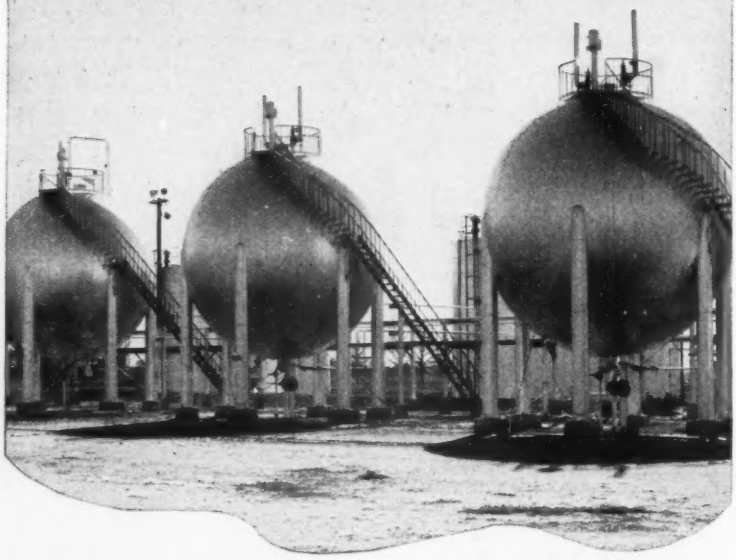

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designed to take a bridge crane. The height from floor to crane rail is not less than 27 ft. in any bay. The distance from the floor to the under side of the roof girders is then 35 ft. Thirty jib cranes with air hoists are mounted on the building columns.

The building has no unsightly saw teeth. It has no windows. Instead artificial lighting spreads the proper amount of light uniformly over the whole floor. The air is treated by modern equipment. The air is cooled in the summer, heated in the winter, and filtered at all times. Truly, a modern building for modern maintenance!

The New Result

We find that our average refinery now has two new buildings, viz.: a central building, a garage building. The area around these two buildings is large and well paved. Paved roads and railroad spurs connect our maintenance area to the rest of the refinery. The field crafts are using up-to-date mobile equipment. Our shop crafts are busily at work on their modern machines. Our store men, with their new mobile equipment, are making quick deliveries to the points of use. Morale is high.

Refinery Maintenance Scheduling

(Continued from page 91)

to be done, the area engineer has relatively little planning to do on these units.

It is our considered opinion that the procedure described herein plays an important part in keeping our maintenance and construction employes actively engaged in productive work, in keeping the downtime of our operating units at a minimum, and in making savings in our maintenance costs. The same system has been extended to all of our plants and terminals, with the necessary modifications to adapt it to the smaller maintenance forces.

The value of any system of scheduling work rests, to a large extent, on the active and wholehearted cooperation of capable supervisors who are constantly alert to see that the men are correctly informed and instructed; that they are supplied with the proper materials and tools to do their job; and that they are promptly reassigned when delayed by factors beyond their control.

It is hoped that the foregoing will not give the impression that we are satisfied with all phases of this system and its functioning. We are not. We have just completed a comprehensive survey which seeks to determine the extent of any wasted labor, as well as its causes and the steps which should be taken to correct it.

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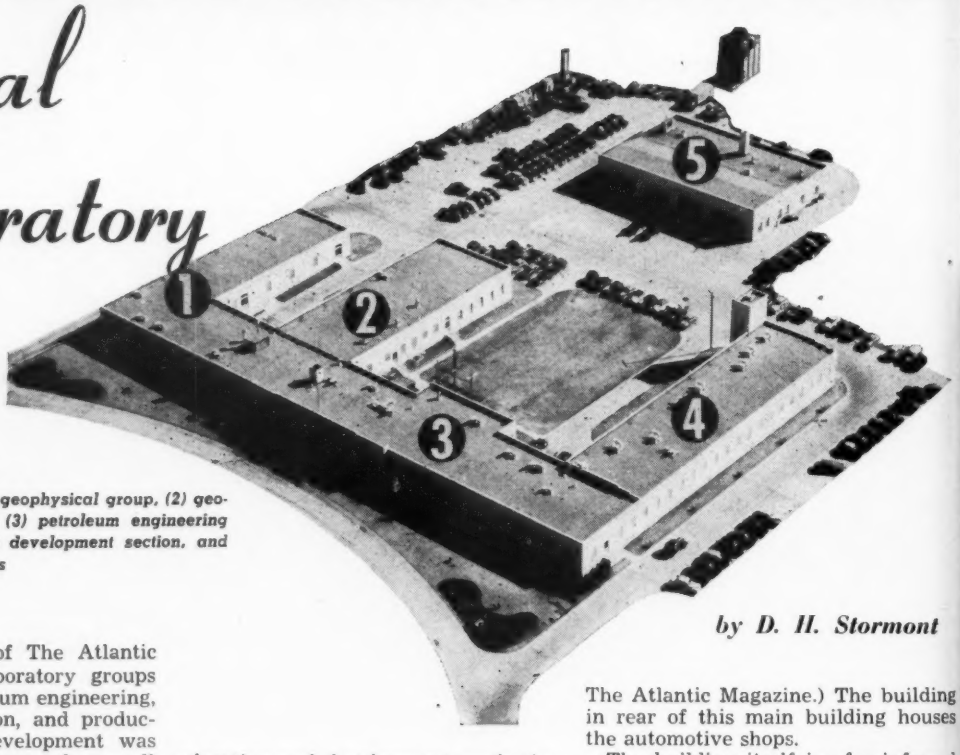
Atlantic Houses All Research Activities in New Central Laboratory



Air view of Atlantic's new laboratories on the northern outskirts of Dallas. Housed in the new buildings are (1) geophysical group, (2) geophysical machine shops, (3) petroleum engineering section, (4) research and development section, and (5) the automotive shops

by D. H. Stormont

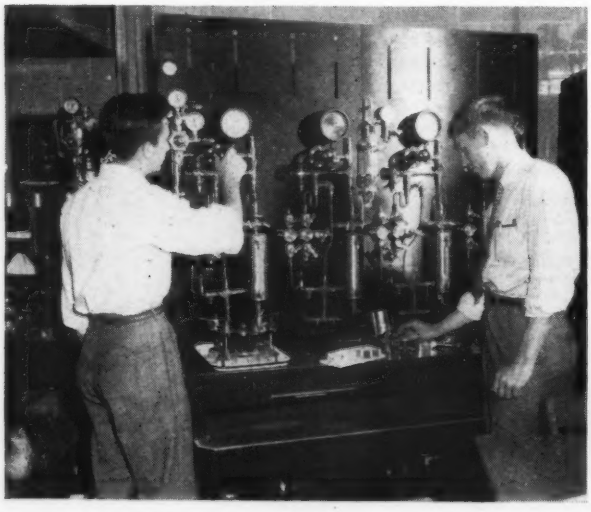
CONSOLIDATION of The Atlantic Refining Co.'s laboratory groups in the fields of petroleum engineering, geophysical exploration, and production research and development was completed late last year and now all are "at home" in a modern air-conditioned building on the northern outskirts of Dallas. These groups formerly were scattered throughout various buildings in Dallas, wherever suitable space was available. Through grouping them into a central laboratory the company is much better enabled to carry out its expanding activities in these fields. Shops for the fabrication and repair of specialized automotive equipment used in oil exploration and development work also are provided at this site.

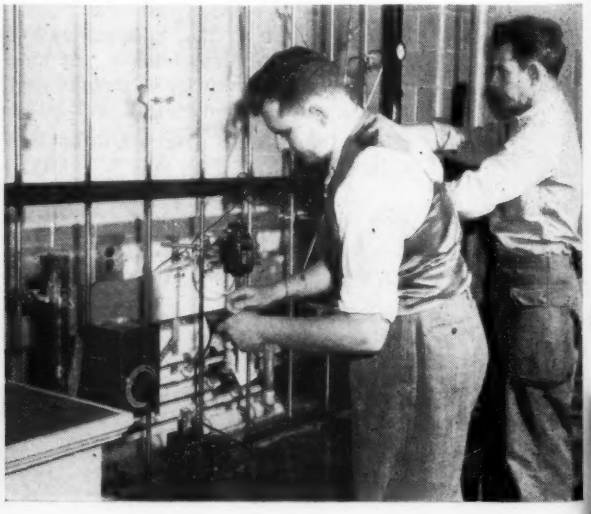
Roughly shaped like a huge "E," the main laboratory building has a useful floor space of about 43,000 sq. ft. Along the front or long side of the "E," the building is 350 ft. in length. Space occupied by each of the three laboratory groups which comprise the Atlantic Laboratories is indicated in the accompanying air photo. (This photo, as well as the others shown here, were supplied by The Atlantic Magazine.) The building in rear of this main building houses the automotive shops.

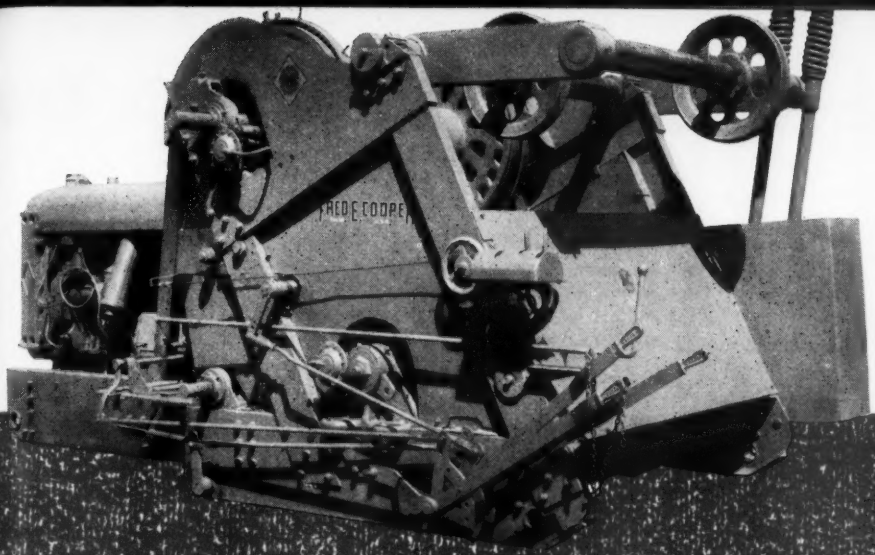
The building itself is of reinforced concrete construction. The exterior is faced with buff-colored structural tile and the interior is finished with a glazed green tile. All ceilings are covered with sound-deadening material and the offices are floored throughout with asphalt tile.

All offices for administrative personnel and senior staff members, as well as calculating rooms, the library, conference rooms, and a 50-seat lecture room, are located along the outer

Left: Test apparatus for determining the capillary water content of oil-bearing rock. Right: Testing and evaluating materials used in oil-field equipment in one of the petroleum-engineering laboratories







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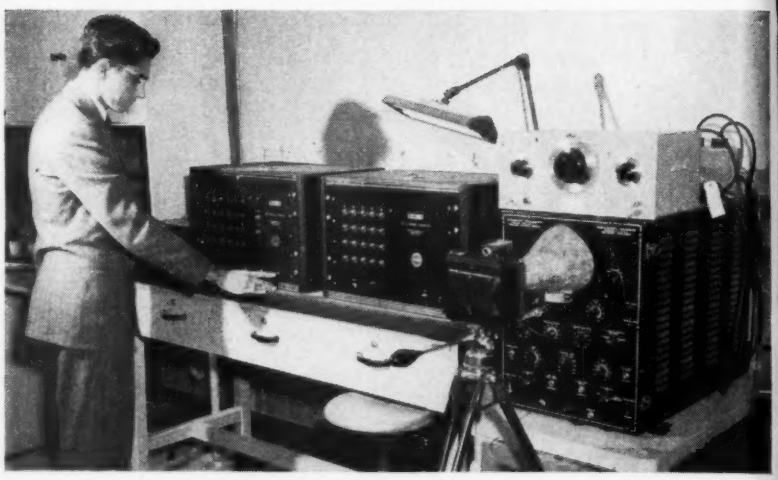
edges of the "E." Laboratories and storerooms largely account for all space on the inner portion of the building. Also included are photographic dark rooms, a glass-blowing room, and an insulated room where geophysical instruments can be tested under a wide range of temperature and humidity conditions. The center wing consists mainly of a carpenter and machine shop.

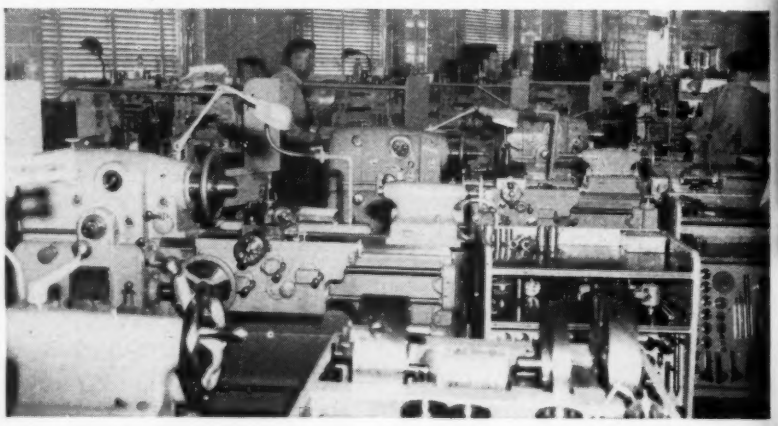
Equipment for supplying utility services is concentrated in a basement underneath the center wing. This includes power generation and transforming equipment for supplying 110 and 220-volt alternating current and direct current, two 80-hp. boilers for steam generation, air compressors, and vacuum pumps. Also located here is the equipment, excluding the cooling tower in rear of the shops, for supplying cool and/or warm air to completely air-condition the building. Rating of this unit is 330 tons daily.

Laboratory Organization

Approximately 150 technicians, scientists, and assisting personnel currently are at work in the laboratories, with an additional 20 mechanics and other personnel being employed in the automotive shops. In the research and development laboratories total personnel at present is about 60, in the petroleum engineering group there are about 40, and in the geophysical section, approximately 50.



Taking reading on a high-precision electronic frequency meter. At right is a cathode-ray oscilloscope and recording camera used along with it



Some of the work benches and lathes in the well-equipped geophysical machine shop

Test equipment for duplicating reservoir flow conditions. The bomb contains a 25-ft. core and "reservoir fluid" is being transferred into it at a pressure of 4,000 psi.

Southwest director of research and development activities is L. P. Whorton. Associate director is Dr. E. R. Brownscombe, who also heads chemical and physical research activities, while Dr. E. H. Koepf is in charge of engineering research. The petroleum engineering laboratory is under the guidance of B. E. Moir, Atlantic's chief petroleum engineer, with J. H. Sullivan as senior chemical engineer in charge. Dr. J. P. Woods is supervisor of geophysical laboratory work.

The field of research or scope of work being done by each of the three laboratory groups is as follows:

Research and development.—Work being done by this group covers the following three general fields: (1) Studies of mechanisms involved in the flow of crude oil and gas through reservoirs, and the factors which govern efficient maximum recovery. (2) Studies of methods which can be used to detect the presence of oil, both from surface information and from holes drilled through the various strata. (3) Studies designed to aid in efficiently completing wells once they are started and to prevent damage to the reservoir through use of improper completion methods.

Included in this program are hydrocarbon phase relationship studies and studies of basic physical data on reservoir fluids. Equipment is provided for (1) research into fluid flow through porous media, (2) obtaining physical data on reservoir media, and (3) duplication of reservoir conditions under which various multiphase systems are studied. Various electrical and electronic measuring devices are being developed, and basic physical research on seismic exploration and electrical logging is conducted. Basic studies of the physical and chemical properties of drilling fluids are being carried out. Reservoir-engineering studies of the development and use of methods of reservoir analysis are carried on.

Petroleum engineering. — This section, officially known as the chemical engineering unit, is concerned primarily with obtaining basic data (both chemical and physical), and making

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engineering studies analyzing these data and interpreting them into factual conclusions from which methods and equipment are recommended. It coordinates its activities with the other groups in the company in the solution of drilling, producing, and reservoir-engineering problems which require laboratory equipment, approaches, data, and/or background.

Basic data obtained for studies relating to reservoir engineering problems include routine core analysis of all wells drilled by Atlantic in the Southwest, Middle West, and Rocky Mountain areas; determination of other reservoir rock characteristics such as connate water and resistivity; data on the reservoir fluids properties under reservoir temperature and pressure, and studies relative to static and dynamic relations of the particular reservoir fluids involved within a given reservoir rock. In addition, electrical model studies are conducted to determine optimum producing methods and the maximum rates of withdrawal.

Drilling and producing problems studied include many diverse subjects such as corrosion, emulsions, drilling muds, and problems involved in lifting equipment. Included in this group are the analytical and field evaluation laboratories which, operating in laboratory and field as required, obtain data and perform evaluation tests on materials contemplated for purchase for operating activities.

Geophysical laboratory.—Chief functions of this group are to develop, construct, and repair geophysical instruments. It manufactures or adapts all geophysical equipment used by Atlantic field parties, both for land and offshore work. It does work on radiolocation and radar equipment, low-frequency amplifiers, radios, resistivity logging machines, and galvanometers. It works on armored cables, making them more suitable for use with over-water seismic operations, weaves more durable coverings for shooting and recording lines, and experiments with geophysical equipment so that it can be usable under widely varying field conditions.

Laboratory and shop service work. In the shop at rear of the main laboratory building, the company's automotive department personnel adapt commercial vehicles for use as explosive, shooting, and water trucks for seismograph parties. They mount the core-drilling equipment, fabricate cabs and bodies, lengthen frames, and perform repair work on these specialized vehicles as well as on some of the cars and trucks in general oilfield use.

In the main building, its material department maintains a stock of special materials and parts to provide rapid service for the work conducted in the laboratory and by field parties scattered in various parts of the country involved in Atlantic's domestic producing activities.

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Trends in

Cat Crackers, Catalysts, And Product Treating

*by Edwin F. Nelson**

THE development of catalytic cracking offers an interesting illustration of the rather complex solution to a complex problem followed by simpler solutions as the problem was further investigated. The first commercial fluid unit, built by Standard Oil Co. of Louisiana at Baton Rouge, was placed in operation in 1942. This unit was the result of bold and brilliant pioneering by the Jersey organization. Subsequent experience has shown, however, that great simplifications in design are possible. One of the earliest changes came with the realization that the entire quantity of circulating catalyst need not be taken through the cyclones.

The bottom drawoff design was used in most of the fluid units built during the war. The separate hoppers in the catalyst circuit have disappeared, and the operating flexibility of the process has been enhanced by the possibility of variable reactor catalyst inventory.

This design was not accepted as the ultimate. In our Riverside laboratories we built a number of pilot plants to study various types of designs. One of these, which is shown in Fig. 1, was found to have considerable merit, and it became the prototype of the Frontier unit, which was then the smallest commercial fluid unit built. Noteworthy features of this design are the equal elevation of reactor and regenerator, which was obtained by operating the regenerator under pressure, giving minimum over-all height, and the replacement of Cottrell precipitators by an oil scrubber. The Frontier unit was highly successful, and is operating profitably today.

Another type of operation which we studied at Riverside involved a moving nonfluid catalyst bed in reactor and regenerator combined with the fluid feature of gas-lift catalyst transport. Large catalyst spheres of about $\frac{1}{16}$ in. diameter were used. Our first pilot plant of this type involved countercurrent flow of oil and catalyst in the reactor. In this design

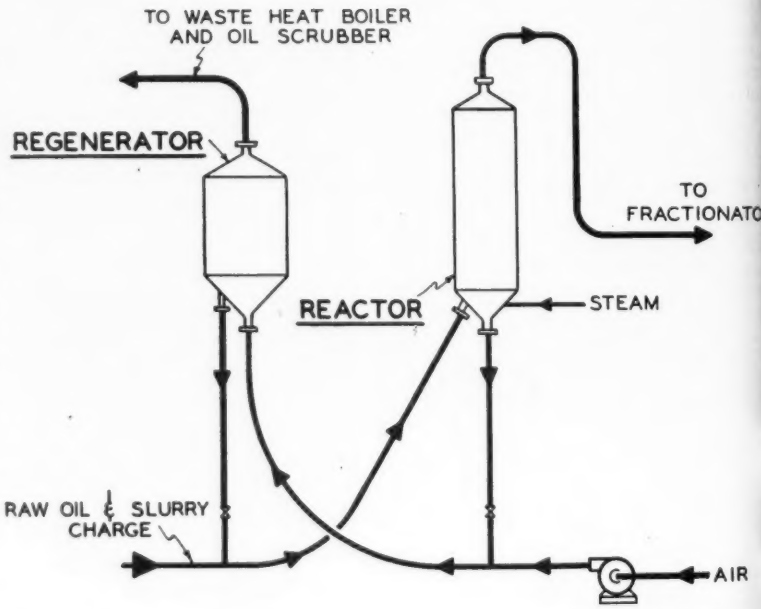
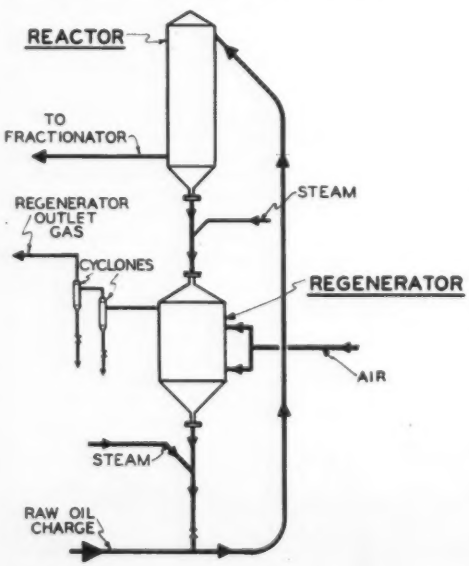


Fig. 1—(Above) Riverside pilot plant (Frontier type)



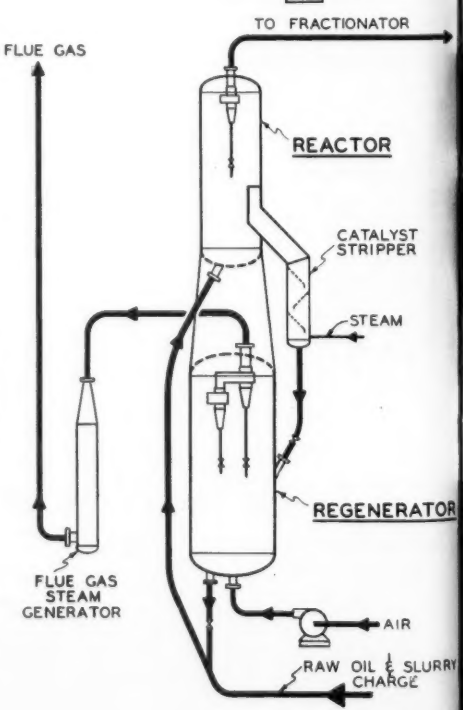


Fig. 2—(Left) Riverside moving-bed pilot plant —concurrent reactor
Fig. 3—(Right) U.O.P. fluid plant (Aurora type)

*Vice president, Universal Oil Products Co., Chicago. Portion of paper presented at recent annual meeting of Western Petroleum Refiners Association, San Antonio.

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separate gas stream was used for catalyst transport.

The results obtained with this plant were sufficiently interesting to justify construction of an improved pilot plant, shown in Fig. 2. Here the reactor flow is concurrent and the oil charge is used to lift the catalyst. This pilot plant was operated successfully for some time, and a number of commercial designs of this type were studied. In the end we concluded that there was no real advantage to large catalyst particles.

A number of other designs have been worked out in engineering detail, and several of them have been tried on the pilot plants. As a result of these studies, it was concluded that the design shown in Fig. 3 represented the most advantageous design from the standpoint of capital investment, operating cost, and yield and quality of product. The first commercial installation of this design was made by Aurora Gasoline Co.* at Detroit, and this plant has now been in operation almost 2 years.

Considering all the fluid catalytic cracking designs, there has been or is being installed a total capacity of approximately 1,000,000 bbl. per day. Of this 1,000,000 bbl. capacity, about 475,000 bbl. is since the war's end.

Aurora is the only unit of our improved design in operation today. There are, however, nine units, with a total capacity of approximately 80,000 bbl. per day of charging capacity, of this design under construction at the present time, and several will be in operation this year.

*See The Oil and Gas Journal, August 9, 1947, page 80.

Cracking Catalysts

While improvements have been made in the mechanical features of catalytic crackers, the catalyst is still the vital part of the process. Continuous research and development are in progress to improve "product distribution," quality of products, and catalyst consumption. On product distribution, the effort has been concentrated on reduced coke formation, in that the coke-burning equipment, the regenerator, represents a substantial portion of the catalytic cracker, and in most limits plant capacity.

At present, three basically different types of cracking catalysts have been developed and are used commercially. In the order of development these are: (1) the natural catalyst, as typified by super filtrol, an acid-treated bentonite clay; (2) silica-alumina catalyst, which consists fundamentally with alumina with silica gel, and (3) silica-magnesia catalyst, which is similar to silica-alumina except that magnesia replaces the alumina.

Natural catalyst, being a natural product, is less uniform in quality than the prepared synthetic catalysts, and has the disadvantage of being adversely affected when exposed to high-sulfur feed stocks and higher temperatures. It is lower in price per pound than synthetic catalysts.

Synthetic silica - alumina catalyst was of extreme importance during the war years when catalytic cracking was called upon to bear the brunt of the aviation-fuel and synthetic-rubber programs. It continues to hold a leading position due to its properties which combine catalytic stability and high octane of the gasoline produced.

Silica - magnesia catalyst was developed in the early days of catalytic cracking, but is just beginning to become of interest commercially. Silica-magnesia is commanding attention because of its better resistance to steam deactivation and because it offers a means for obtaining a greater yield of gasoline from a given quantity of feed stock. This additional gasoline is obtained largely through a reduction in yield of C_4 fractions. The gasoline produced is less volatile and lower in octane number than that obtained through the use of silica-alumina catalyst.

Both of the synthetic varieties can be produced as either a ground powder or in the form of microspheres. The latter form is coming more and more into use, since the absence of sharp edges reduces mechanical wear of both catalyst and physical plant equipment.

The more or less mechanical problems associated with the handling of fluid catalyst have been developed to the state where low catalyst-consumption rates can be obtained. Intensive research work, however, is being directed toward the development of new or modified catalysts, and it is expected that such improved catalysts will be available to the refiner in the near future.

The production of catalytic gasoline introduced certain treating problems. These gasolines are fundamentally more stable than thermal gasolines, but contain small concentrations of thiophenols and other acid oils. Thiophenols are extremely detrimental to storage stability, but fortunately are quite acidic and are easily removed by a simple caustic wash. Acid oil content must generally be reduced in order to avoid gum formation; this is also accomplished by a caustic wash.

The addition of a potent synthetic inhibitor to caustic washed catalytic gasoline will almost result in a product of superior stability characteristics. The mercaptan content of catalytic gasoline is extremely low and if the proper inhibitor is added, sweetening will occur in the rundown tanks within a few hours.

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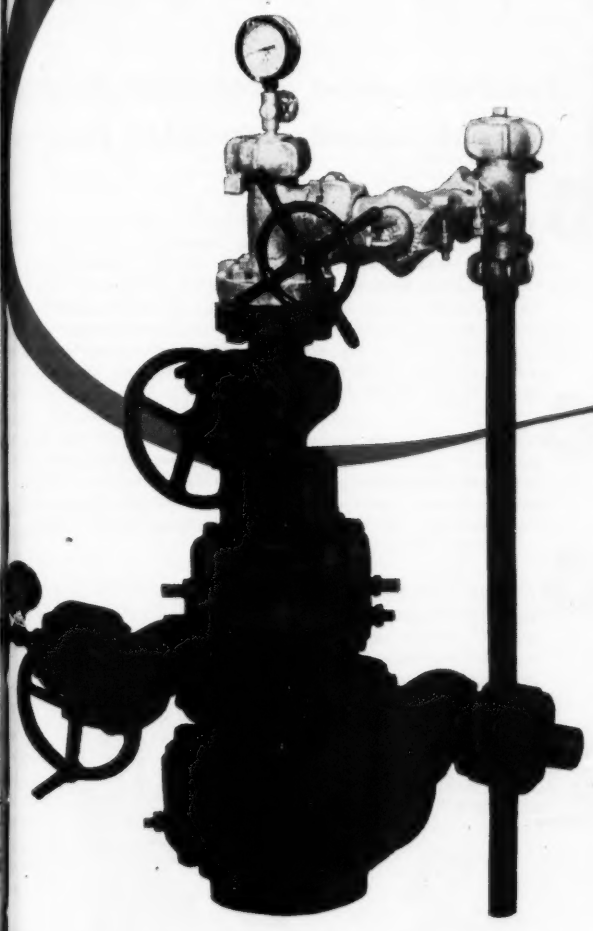

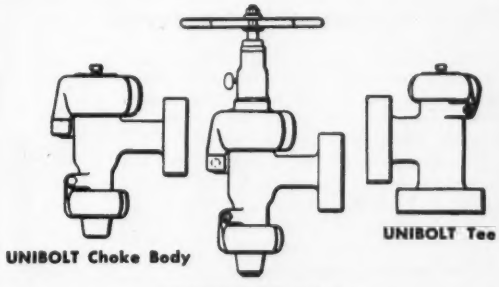

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UNIBOLT pre-assembled and tested flow manifolds of carbon steel last indefinitely on non-corrosive wells. They combine all essential fittings required above the master valve of a Christmas tree: Tee or Cross with blanking plug tapped for gauge, Adjustable Wing Valve, and Positive Choke Body with coupling on its outlet for the flow line. All connections in the manifold are UNIBOLT, which means that they are stronger, safer, lighter weight, less bulky, completely interchangeable and more economical. And only UNIBOLT Flow Manifolds utilize Flow-Rated Beans, which assure the exact production of any predetermined quantity of fluid.

For Corrosive Wells

UNIBOLT Flow Manifolds for corrosive wells have all the features of safety, convenience and economy as outlined at left, the only difference being in the steel. UNIBOLT engineers, after long experimentation, have developed a special high chrome alloy, which, when given a carefully controlled heat treatment, produces excellent chemical and physical properties for resisting corrosion. On extremely corrosive wells where ordinary steel fittings required replacement in *forty days*, this special alloy has been in service for *two years* and still shows no signs of corrosion!

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Baash-Ross News

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Constant speed — Constant torque
Variable speed — Variable torque

Complete...

No Rotary Table or Auxiliary Equipment Necessary!

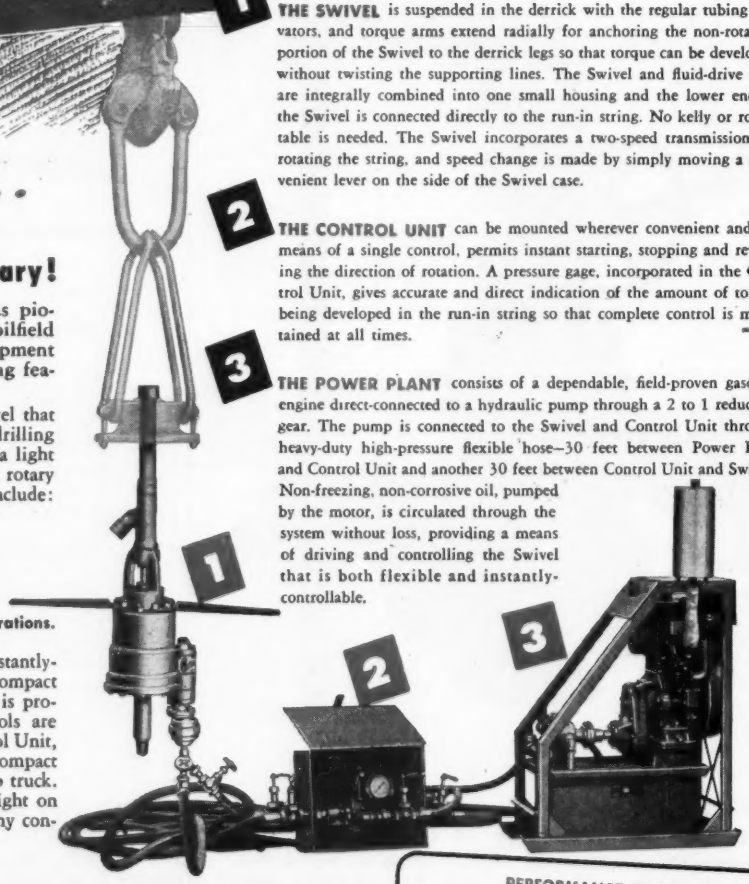
From the same organization that has pioneered so many important advancements in oilfield equipment, comes another *really new* development that has many unique money and time-saving features. It is the Baash-Ross Power Swivel.

This unit consists of a fluid-driven Swivel that can be suspended in the rig—*any* rig, whether drilling or producing—to provide a means of rotating a light string of tools without need for installing kelly, rotary table or other heavy equipment. Applications include:

- **Internal cutting and fishing jobs**
- **Drilling out bridges**
- **Scraping liners**
- **Drilling out cement in tubing**

...and other similar operations.

The Swivel is driven by positive, instantly-controlled hydraulic pressure generated by a compact Power Unit, and continuous finger-tip control is provided by a Control Unit in which all controls are centralized. The entire assembly—Swivel, Control Unit, Power Plant and connecting equipment—is so compact it can be readily transported in a small pick-up truck. And if desired, the Power Plant can be left right on the truck for quick jobs—or can be set off at any convenient place on or near the rig.



1 **THE SWIVEL** is suspended in the derrick with the regular tubing elevators, and torque arms extend radially for anchoring the non-rotating portion of the Swivel to the derrick legs so that torque can be developed without twisting the supporting lines. The Swivel and fluid-drive unit are integrally combined into one small housing and the lower end of the Swivel is connected directly to the run-in string. No kelly or rotary table is needed. The Swivel incorporates a two-speed transmission for rotating the string, and speed change is made by simply moving a convenient lever on the side of the Swivel case.

2 **THE CONTROL UNIT** can be mounted wherever convenient and, by means of a single control, permits instant starting, stopping and reversing the direction of rotation. A pressure gage, incorporated in the Control Unit, gives accurate and direct indication of the amount of torque being developed in the run-in string so that complete control is maintained at all times.

3 **THE POWER PLANT** consists of a dependable, field-proven gasoline engine direct-connected to a hydraulic pump through a 2 to 1 reduction gear. The pump is connected to the Swivel and Control Unit through heavy-duty high-pressure flexible hose—30 feet between Power Plant and Control Unit and another 30 feet between Control Unit and Swivel. Non-freezing, non-corrosive oil, pumped by the motor, is circulated through the system without loss, providing a means of driving and controlling the Swivel that is both flexible and instantly-controllable.

TWO TYPES...MANY APPLICATIONS

To meet the various requirements of different operators, the Baash-Ross Power Swivel is available in two types . . .

1. **MODEL "F"** which provides a choice of two rotating speeds as indicated at right, and in each speed both the torque and RPM remain practically constant at all times.
2. **MODEL "FV"** which provides two speed ranges, and in each range both the torque and RPM are variable between wide limits as indicated at right.

Since the Power Swivel requires no drawworks or other heavy equipment that is complicated and costly to install, it is ideal for many light rotating jobs—for drilling out cement plugs and sand bridges, for scraping paraffine, for rotating internal cutters, etc.

On cutting jobs its smooth, sensitive, easily-controlled hydraulic drive is far superior to the irregularities and uneven feed of manual rotation. It is also safer because there is no need for workmen to be near the stretched pipe while it is being cut . . . nor for them to work on makeshift platforms. The Power Swivel can be operated at any height in the rig, eliminating need for cutting off the run-in string at floor level.

PERFORMANCE DATA

Swivel Capacity—80,000 lbs. Tensile Loading.

Speed Model "F", 17 RPM—constant—low speed
34 RPM—constant—high speed
Model "FV", 1 to 17 RPM—variable—low speed.
1 to 34 RPM—variable—high speed.

Torque Maximum—both models . . . 15,000 inch-lbs.
Elevator Neck—2⅞" O.D.
Lower Stem Joint—2⅜" API Regular Pin.
Goose Neck—2" API Line Pipe (female thread).

Power Unit 4 cycle gasoline engine, 9.2 h.p. at 2200 RPM, geared 2 to 1 reduction.
Magneto, spark plugs and wiring all spark-proof—exhaust protected with spark arrestor.
Pump equipped with safety valve for 1000 p.s.i. maximum pressure.
Sump Capacity—20 U. S. gallons.

Write for full details
—or see your Baash-Ross Representative

Salt-Water Disposal

. . as practiced in Kansas

by J. R. Hatfield and L. B. Hicks**

MOST of the oil produced in Kansas is from the Arbuckle lime. This formation usually has a very active water drive. With present crude-oil prices, many wells produce as high as 98 per cent water before their economic limit is reached. This results in some oil wells producing as high as 500,000 bbl. of salt water during their economic life. These conditions make disposal of salt water as major operating problem for most oil producers in the state.

It has been found in Kansas that the most practical method of disposing of large quantities of water is a disposal system consisting of a central disposal well which is connected to the tank batteries of a number of preferably closely grouped leases by a pipe-line gathering system. It is considered desirable in the design of disposal systems to (1) deliver clean water from the battery to the system; (2) permit steel to have as little contact with the water as possible, and (3) exclude air from the pipe-line system and disposal well.

Design of Disposal Well

The lower Arbuckle lime, Granite wash, Reagan sand, or Dakota section are used for the disposal of salt water. The Dakota section is shallow. Recently the new state disposal orders have limited surface pressure on shallow wells to 50 psi. This will reduce the number of shallow disposal wells drilled because most of these wells will take very little water with low pressure.

The most successful disposal wells inject water into the lower Arbuckle lime, Granite wash, and Reagan sand. Some of these disposal wells will handle as high as 15,000 bbl. of salt water per day without surface pressure.

Disposal wells are made by converting depleted oil wells, redrilling dry holes, or drilling from surface. Casing must be set and cemented so that injection of water will not injure the oil-producing zone. If oil production is from the Arbuckle lime and injection of salt water is in the lower Arbuckle lime it is good practice to case the Arbuckle lime to a point at least 50 ft. below the deepest subsea total depth for wells within ½ mile of the disposal well. This usually makes it necessary to cement a liner in depleted oil wells when they are being converted into salt-water-disposal wells.

Disposal wells are completed with rotary or cable tools. Cable tools are usually used when depleted oil wells are being converted into disposal wells. If a dry hole is redrilled or a well drilled from the surface the disposal well is usually completed with rotary tools. Circulation is sometimes lost and in order to regain circulation a zone that would have been excellent for disposal may be mudded off.

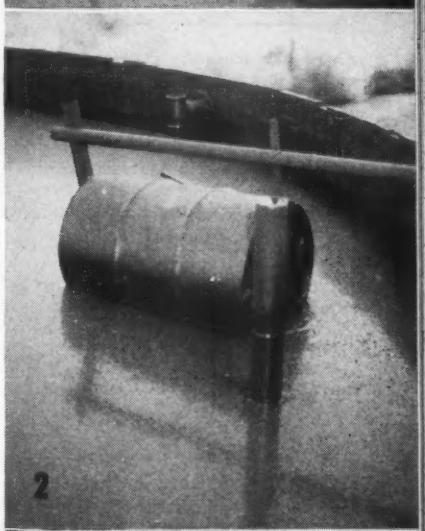
Cement-lined casing or a string of cement or plastic-lined tubing with packer is run inside casing. The annular space between the tubing and casing is filled with fresh water or other liquid to protect the casing and tubing from corrosion. Salt water is injected through the cement of plastic-lined casing or tubing. It is considered good practice to pull the tubing once a year for inspection. This may save an expensive fishing job. The use of cement-lined casing eliminates the need for tubing.

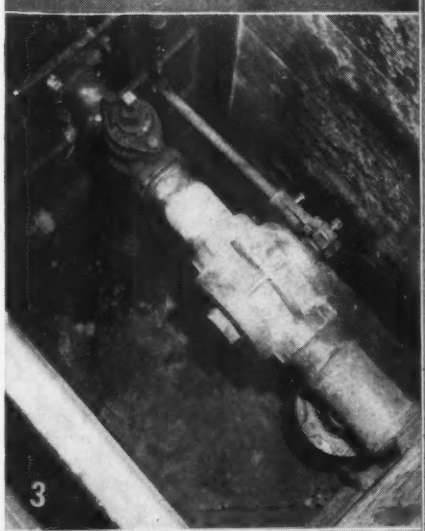
Pit

Salt water is run through a pit before going into the disposal well. The purpose of the pit is to skim off oil and provide settling time so that solids will drop out of the water. The amount of settling time considered necessary to skim off oil and drop out solids varies from a few hours up to 24 hours. The amount of settling time required is a debatable question.

Pits are made of wood, concrete, or steel and range from large and elaborate pits of 10,000 bbl. capacity to small pits of 500 bbl. capacity, depending upon the operator. Most important is that the pit should supply the disposal well with clean water.

The pit is connected to the disposal well by a line with a float-operated dump valve in the line. As water rises in the tank, the float opens the

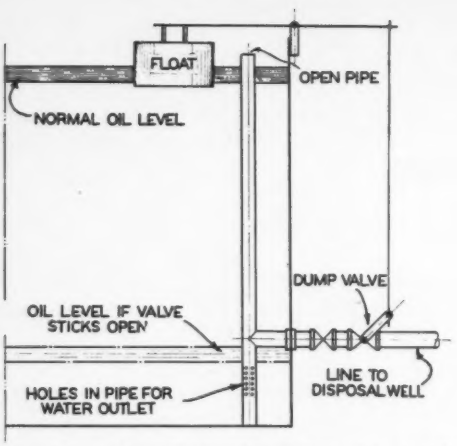


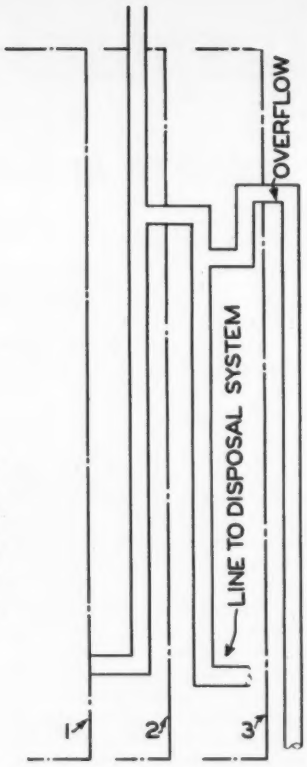


Float mechanisms for operation of the salt-water-pit dump valves are shown in Figs. 1 and 2. In Fig. 1, the float operates inside a section of pipe on the surface of the salt water, while the float in Fig. 2 is buoyed by water and the evaporation-resisting oil film

The two lower photographs are illustrations of two types of float-operated dump valves: Fig. 3 is a lubricated plug valve, and Fig. 4 is a cement-asbestos dump valve

*Cities Service Oil Co., Bartlesville, Okla. Paper presented at spring meeting of the Mid-Continent district, A.P.I. Division of Production, Tulsa, March 23-25.





Above is a schematic drawing of the valving at the settling pit and connections to the injection well. The disposal line is vented to prevent contamination of the injection water by the oil film when the tank liquid level is low. At right is a sketch of the siphon in use in this disposal project. With the gun barrel in position 1, it is an outside siphon, position 2, a half-inside half-outside siphon, and position 3, an inside siphon

valve so that water is permitted to enter the well. This excludes air and allows the well to operate with a vacuum. Many operators keep an oil seal on the pit to exclude air from the water.

Surface Lines

Most operators install cement-asbestos surface lines which connect ths disposal pit with the treating tank at the tank battery. However, cement-lined steel, plastic-lined steel, fiber, and bakelite lines are used.

Most surface lines operate by gravity and are laid to grade wherever possible. This results in deep cuts and bridges or suspension lines being used in some cases. Dirt should be tamped when backfilling on cement-asbestos pipe, with extra care being taken when laying line in deep cuts and across lease roads. Casing conduit is used under highways. When pipe is suspended, it should be insulated to prevent freezing. If the surface line cannot be laid to grade, an automatic venting device should be installed at high points so the line will not gas lock.

Cement-asbestos and cast concrete fittings are installed at junctions, in most cases. These prefabricated fittings at junctions makes it much easier to run scrapers in the lines. This is a great help, because some surface lines require frequent cleaning.

The treating tank is usually connected direct to the surface line by a siphon. Inside, one-half inside with one-half outside, and outside siphons are used. Cement-asbestos, cement-lined steel, and plastic-lined steel pipe are used in siphons. Cement-asbestos fittings are used with cement-asbestos piping. Combination flanges or Dresser sleeves are usually used to connect steel line with cement-asbestos pipe.

The design and installation of surface lines are very important. Lines should be designed so they will handle the water production to the economic limit of each lease. When installing the lines care should be taken in order that they may be clean and have full opening.

Costs

The investment cost per well served varies considerably from system to system. These costs depend upon whether a depleted oil well in the proper location is available for the disposal well, the spacing of the oil wells, number of wells served, design and plans, etc. The investment cost for most systems ranges from approximately $1,000 to $3,000 per well served.

Operating costs also vary considerably, depending principally upon the disposal well. Some disposal wells will take large quantities of water with very little trouble, where other disposal wells require frequent cleaning out and acidizing. Some surface lines plug frequently where others do not. The operating cost for most systems varies from 2 mills to 5 mills per barrel of salt water handled.

General

Care should be taken to keep oil and b.s. from entering the disposal system, because these substances will

Cement-lined pipe and fittings are used in this well-head connection

In this disposal well head, cast concrete fittings have been employed

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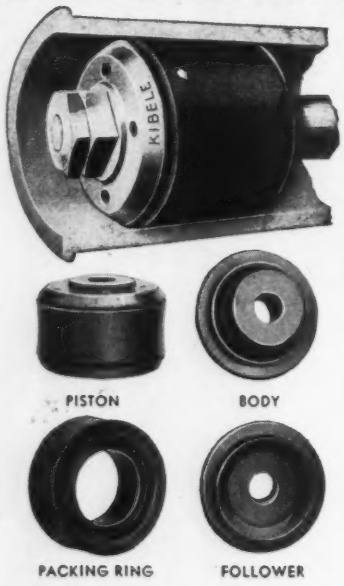

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plug lines. This makes it necessary to keep the treating tank at the battery clean and operating properly.

Air should not enter lines or the disposal well because salt water will be more stable and less corrosive if not permitted to come in contact with air. Most of the systems in Kansas are either of the closed or semiclosed type.

Close attention and supervision are required to operate salt-water-disposal systems at the lowest cost. The float valve should be checked at least once a day. Lines should be cleaned with a scraper before they are completely plugged. The tubing should be pulled once a year for inspection. The pit should be kept clean. Design of a disposal system is very important, but the operation of the system is equally important.

Questions and Answers

Q. What is the most practical piping arrangement between a treating tank or pressure treater and the salt-water gathering system?

A. If possible, the treater should be connected direct to the gathering line. In some cases, a small accumulator tank may be necessary to take care of high rates of flow over short intervals or permit gas to escape.

Q. How can crude oil be prevented from getting into gathering lines?

A. This is usually caused by a thick layer of emulsion between the water and oil in the treating tank and can be prevented by keeping the treater clean of emulsion and setting the siphon at the proper height to hold a safe water column above the water outlet.

Q. How can crude oil be removed from gathering lines?

A. If lines are clean and laid to grade, oil will carry through to the pit at disposal well. The removal of oil should be attempted in the following order: (1) Pump water through in an attempt to flush out the oil. (2) Pump a scraper through the line. (3) Part the line a few feet down stream from the high point and flush out.

Q. What is the most economical and practical type of fittings for gathering line junctions?

A. Prefabricated asbestos-cement or concrete fittings.

Q. What is the most practical type of pit at the disposal well?

A. Concrete, wood, and steel are in general use. Concrete is probably more universally used; however, in many cases wood tanks are preferable from the cost standpoint.

Q. What size of pit should be installed?

A. Some years ago, it was considered good practice to have 24-hour settling time. More recently the trend has been to 4 to 6-hour settling time.

Q. What types of pumps are most practical for pressures up to 100 psi.? Above 100 psi.?

A. Our practice has been to use a bronze rotary pump up to 100 psi., and, above 100 psi., to use a reciprocating pump of bronze, bronze trim, or porcelain-lined cylinders.

Q. What is the best design of valve to be used in gathering lines?

A. Cement - asbestos is probably best; however, any valve for salt water service is expensive and the number of valves should be held to a minimum.

Q. What is the most practical type of connection between steel and cement-asbestos lines?

A. Special flanges or Dresser sleeves are used.

Q. How can the formation of solids in gathering lines be prevented?

A. By keeping the salt water as stable as possible; that is, preventing contact with air and steel or preventing sludge from entering the lines.

Q. How can solid deposits be removed from gathering lines?

A. By use of scrapers, which are pumped through the lines. To do this, it is necessary to part the line at the battery and at the line junction.

Q. How should electrically driven intermittent pumps be used on a gathering system?

A. A tank should be placed at the pump location to permit accumulation of water. A float and electrical switch can then be used to provide the intermittent operation.

Q. What method is best for crossing roads with cement-asbestos pipe?

A. On main roads steel casing is used for conduit, and on lease roads the line is laid to grade with careful tamping and back filling. Some companies follow the practice of placing a half section of steel pipe over the cement-asbestos line on lease roads, especially where the line is shallow.

Q. In laying cement-asbestos line in deep ditches, what method is used to prevent uneven settling of the pipe?

A. Careful tamping and back filling.

Q. What class cement-asbestos line is used in gravity systems?

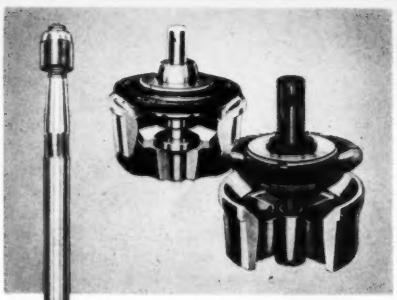
A. Our practice was to use 50-lb. pipe up to the time the manufacturer discontinued making this weight pipe; 100-lb. pipe is now used. When pump pressure is used it is advisable to use 150-lb. pipe.

Q. How should disposal wells be equipped with respect to tubing?

A. If cement-lined casing is used, tubing is not required. If tubing is used, it should be cement-lined and equipped with packer.

Regulations

The Kansas State Corporation Commission and the Kansas State Board of Health regulates salt-water disposal. Before a well can be used for salt-water disposal, Application Form 400 must be filed in triplicate with the Kansas State Corporation Commission. Copies of the application must be mailed to all operators with producing or drilling wells within ½ mile of the proposed disposal well. There is a 10-day period in which objections may be filed. If no one objects the Corporation Commission will issue an order approving the disposal plan.



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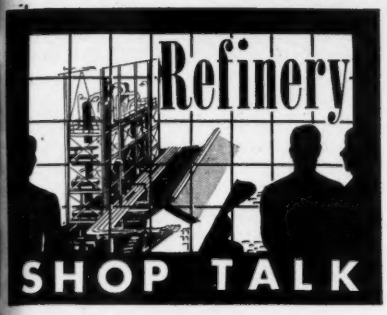

SUBJECT: What are important features in blending and treating light distillate fuels?

DISCUSSION: By Edwin F. Nelson, vice president, Universal Oil Products Co., from paper presented at recent annual meeting of Western Petroleum Refiners Association, San Antonio.

A MAJOR trend which has existed for some years and shows no signs of changing is a steadily increasing demand for light distillates above the gasoline range. To satisfy this demand, it is becoming standard practice to blend distillate fuels from all available stocks of acceptable boiling range. These blends are found to exhibit storage instability of various kinds, including precipitate formation, darkening, and soluble gum formation.

Precipitate formation may occur in periods of from a few days to a year. Blends of sweetened straightrun and cracked distillates from high-sulfur crudes are apparently particularly susceptible. There are, however, some cases in which precipitates have formed even in unblended straightrun distillates from high-sulfur crudes. It is known that disulfides contribute to precipitate formation, and that the bad effect of sweetening is due to the conversion of the foul-smelling but innocuous mercaptans into sweet but dangerous disulfides.

Another known source of trouble is caustic washing, which may leave sodium salts of organic acids dissolved in the oil. These salts may be removed by a subsequent water wash, and in certain cases it may be advisable to have a filtration after the water wash. In certain circumstances it is possible by using dilute caustic—less than 5° Be.—to reduce the sodium salt pickup by the oil and eliminate the need for water wash. In the case of some blends where precipitate formation is particularly rapid, a reasonably stable product is obtained by carrying out the filtration after several days' storage.

Color and Gum Formation

Color formation, unlike precipitation, does not affect the performance of burner oils, but is nevertheless of some importance from the sales angle. Here, too, the chemistry is obscure. Nitrogen bases are thought to be involved, and acid treatment usually improves color stability. As it is usually carried out, however, acid treatment results in some sulfonation, with consequent precipitate and haze formation. The use of dilute acid is a possible solution which requires further investigation.

Soluble gum formation is found in cracked fuels and in a few virgin fuels. Strong sulfuric acid treatment improves gum stability, at the risk of the other problems just mentioned. The suggestion has been made that soluble gum is harmful in distillate fuels, in apparent analogy to its well-known action in gasoline. This suggestion has resulted in the development of analytical methods, and a large amount of performance testing has been carried out.

No definite evidence of operating difficulties due to soluble gum has been obtained. This fact is not surprising, since use of distillate fuels in domestic oil burners or diesel engines does not involve conditions resembling those found in the automotive carburetor and intake manifold, where the fuel is vaporized in the presence of air prior to the combustion zone.

Solvent extraction to remove heavy aromatic oils and improve cetane number may offer a possibility of upgrading heavy cracked distillates.

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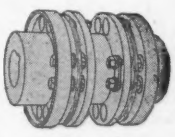
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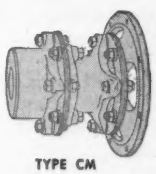
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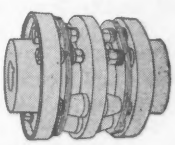
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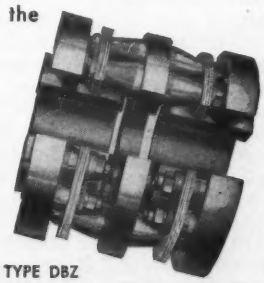
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QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

Circulation Control in The Fluid Process

How is the circulation of catalyst controlled in the fluid catalytic cracking process?—P. J. D.

The catalyst used in this process is a solid material which has been ground sufficiently fine that after aeration with gas, vapor, air, or steam, it can be made to flow or be transferred like a liquid. It is thus termed a fluid catalyst. The purpose of the catalyst circulation is to:

1. Supply catalytic action for cracking.
2. Supply heat to the reactor, in the form of sensible, latent, or decomposition heat as required, from the regenerator.
3. Carry coke formed on the catalyst from reactor to regenerator.
4. Provide a method for heat generation in the regenerator by the combustion of the coke from the catalyst, using blower air.

In carrying out these purposes, two densities of phase are encountered:

1. Dense phase.—In a slow-moving bed, such as in a standpipe (see Fig. 1) where the vapor velocity is from 1.5 to 5 ft. per second and the fluid density from 15 to 40 lb. per cu. ft., the bed is said to be in a dense phase.

2. Dilute phase.—In a fast-moving bed, such as in a carrier line, where the combined stream velocity is somewhere over 15 ft. per second and the fluid density is under 5 lb. per cu. ft., the flow may be considered to be "dilute phase" flow.

The fluid density can be altered, within limits, by varying the amount of gas used and by changing the rate at which the fluid mixtures move.

Circulation of catalyst through the unit is accomplished by regulating these different flow conditions. Standpipes (vertical lines containing downflowing catalyst) are used to build up fluid heads to provide the necessary differential pressures. The downflowing catalyst must be aerated with air, steam, or gas, to set up a fluid condition in the standpipe and maintain the desired density. If the downward velocity in the standpipe is appreciable (about 2 ft. per second), the aeration medium is carried downward, and by supplying aeration at intervals in the standpipe, the density is kept constant while the pressure is increasing. In other words, the aeration offsets the compression of the flowing gas, which would otherwise become more dense as it moves down the standpipe, due to increased head above it. This uniform density provides a smooth operation in the standpipe and slide valves. If the downward velocity is too small, the aeration medium moves upward and the density is not uniform.

The pressure at any given elevation in the unit, say at the base of a standpipe just above the slide valve, is equal to the total catalyst head above that point, plus the pressure existing in the equipment above the catalyst bed. Thus, in the standpipe below the reactor, the pressure at the bottom of the standpipe is equal to the static head resulting from the density and height of the catalyst above that point, plus the pressure at the top of the reactor. The highest pressure in the flow system exists at this point, and therefore a source of flow is available. Standpipe densities may range from 15 to 40 lb. per cu. ft., but are usually around 25.

In the design of standpipe flowing conditions, the amount of aeration is calculated to give a smooth dense-phase fluid flow, but in actual operation, aeration is usually held to a minimum operable value so as to avoid excessive erosion of standpipe walls and slide valves. Erosion in the standpipe is thought to increase in about the order of the velocity to the third power.

Circulation out of the standpipe and into the carrier line is controlled by the slide valves at the base of the standpipes. As protection against shutdown from erosion, two slide valves in series are provided. Normally the top valve is left open and the necessary circulation and pressure drop is controlled by the bottom valve until it is worn. The spare valve is then used. The slide valve, which is a modified gate valve, is automatically controlled by instrumentation to maintain a desired level of catalyst in the vessel above the standpipe, but may also be controlled to maintain a desired temperature. For example, if a higher temperature is desired in the reactor, the slide valves under the regenerator are made to automatically open further to allow more circulation to the reactor. The slide valves under the reactor then automatically open to take care of the additional catalyst and maintain the reactor level.

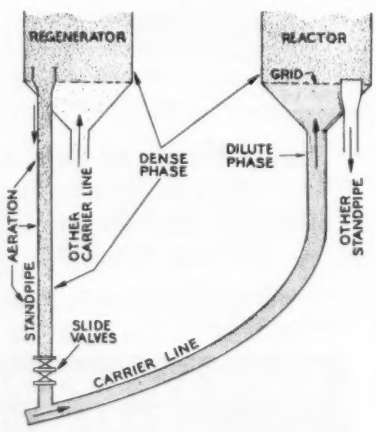

Fig. 1—Diagram of fluid catalytic flow lines

If flow is to be maintained through a slide valve, a pressure differential across the slide valve must exist. This is very important in operation, because a loss of differential might result in reverse flow. In the case of the reactor, this would mean allowing air to enter the reactor with the oil, which could result in a violent explosion. Steady flow through the slide valve is therefore important and is aided by maintaining a constant-density bed at the slide valve.

After the flowing catalyst passes through the slide valve it is met with a flowing liquid or vapor in the carrier line. Here the type of flow is called "dilute phase," as indicated in Fig. 1. The energy to establish flow comes from the pressure of the carrier medium rather than from gravity as is the case in the standpipe. The minimum velocity at which this dilute phase flow occurs is about 15 ft. per second. To avoid excessive erosion, maximum velocities are usually held to 40 ft. per second, with 30 being about the average. If the velocity is too low in the carrier line, the catalyst will slump back down the line, causing "slugging," or even plugging.

Since a slide-valve differential pressure has to exist, the pressure at the inlet of the carrier line will be from 3 to 6 lb. (or sometimes more) less than in the standpipe above the slide valve. This pressure is controlled mainly by the pressure of the vessel into which the dilute-phase catalyst is flowing, after other conditions of carrier air and density have been stabilized.

The carrier medium moves at a higher velocity than the catalyst particle and thus a slip factor is introduced which cannot easily be evaluated. Some allowance in the density must be made, and usual design practice is to arbitrarily set the slip at 2:1, i.e., double the density calculated from the amount of gas and catalyst flowing, when estimating the head differential of the carrier line. Densities in carrier lines are held under 5 lb. per cu. ft. (neglecting the slip).

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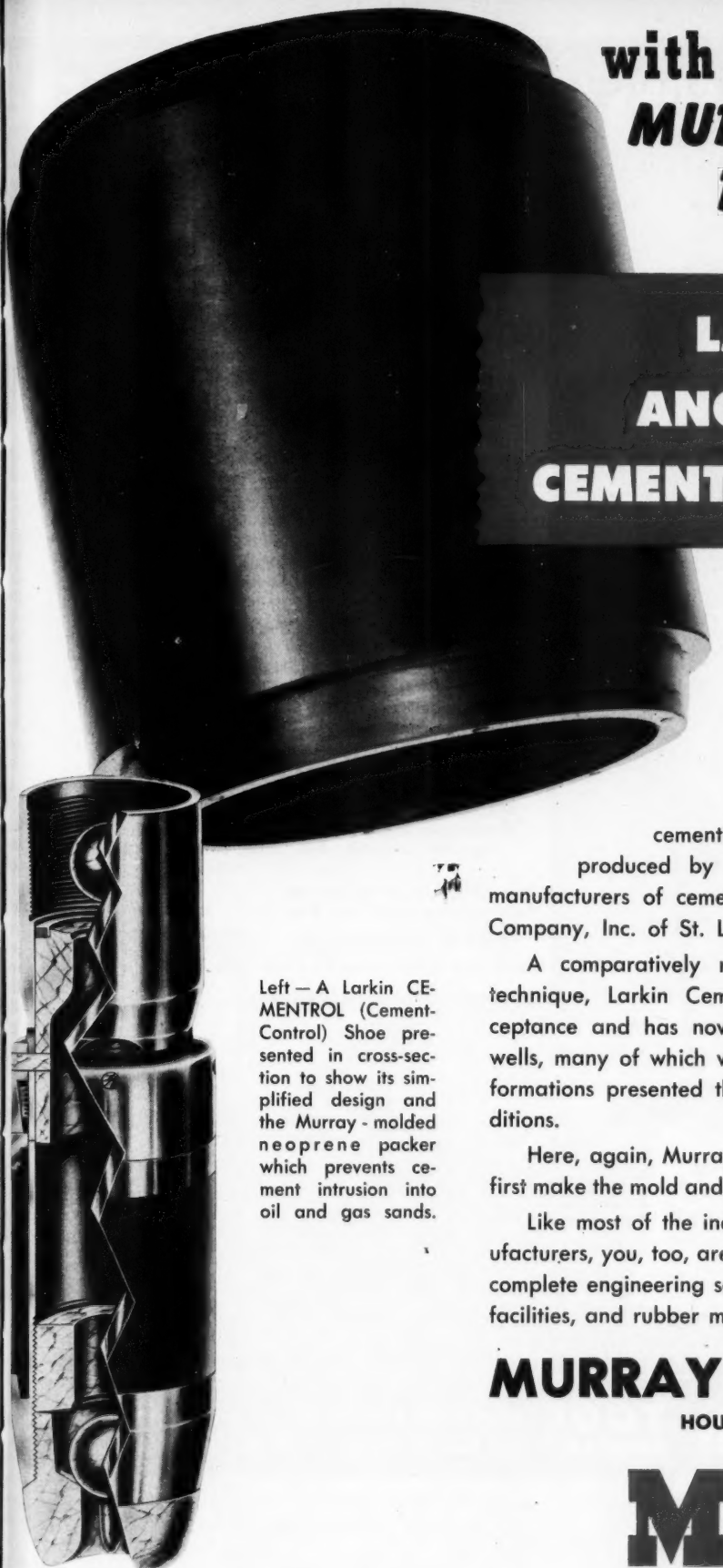

Left — A Larkin CEMENTROL (Cement-Control) Shoe presented in cross-section to show its simplified design and the Murray - molded neoprene packer which prevents cement intrusion into oil and gas sands.

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ENGINEERING fundamentals

Computation of Fluid Displacement From Equipressure Lines

SEVERAL literature sources[1,2] give the method for computing a flood-front advance from equipotential and flow-line patterns obtained for a well or reservoir system by the use of electrical-model analogies.

The method of computation assumes that the displacement efficiency is uniform and that the pattern of equipotential lines will not be changed by the displacement process. A given particle is assumed to move along its flow line in proportion to the pressure gradient along the flow line. If the initial positions of two particles are known, then after an interval of time the new positions are known from the velocity and the time interval involved. The movement of particles along all possible flow lines is the fluid-front advance.

Darcy's law states that the velocity of flow is given by:

$$v = \frac{k}{\mu}\frac{dp}{dl} \qquad (1)$$

Although this velocity is not a true fluid velocity it can be assumed to be always the same function of the true velocity throughout the calculation. A particle traveling with this velocity v would in a period of time dt travel a distance dl where:

$$dl = vdt \qquad (2)$$

Combining Equations 1 and 2 gives the following differential equation:

$$\frac{1}{dp/dl}\,dl = \frac{k}{\mu}\,dt \qquad (3)$$

or

$$\int_{L_1}^{L_2}\frac{1}{dp/dl}\,dl = \frac{k}{\mu}(t_2 - t_1) \qquad (4)$$

The distance traveled along a stream line in a finite interval of time is found from the integral of the above equation. The integration can be performed graphically. If p is plotted as a function of the distance along the stream line the slope of such a plot gives dp/dl. Now by plotting in turn the reciprocal of dp/dl versus distance the above integral can be found. Performing the same steps for different flow lines the respective distances traveled in the same given interval of time along each flow line. Adding the computed distances to the original positions of the particles in question on the flow line gives the positions of the particles at the new time. A succession of such calculations for all flow lines establishes the flood front.

The above process can be simplified by approximating the integrals. Equation 3 can be written as an approximation by:

$$\frac{(\Delta L)^2}{\Delta P} = \frac{k}{\mu}\Delta t \qquad (5)$$

Where ΔL is the distance between two successive equipressure lines, ΔP is the pressure difference between the two successive equipressure lines, and Δt is the time consumed by the particle in moving from the high equipressure line to the low one. Adding all such Δt values along any flow line from the original point gives the time interval for the particle to reach a specified equipressure line.

To illustrate the above calculation consider the equipressure lines and flow lines for the system shown in Fig. 1.[3] Flood front positions are found from Equation 5. Actual times cannot be calculated without a knowledge of actual pressures or relative permeability and reservoir viscosity. Hence, Equation 5 is used to compute relative times, thus:

$$\Delta t \propto \frac{\Delta L^2}{\Delta P}$$

On the figure the value of $\Delta L^2/\Delta P$ for the various intervals are plotted as numbers. A flood front is found by drawing a contour line for a constant value of this number. The solid lines are so drawn to show progression of the flood front.

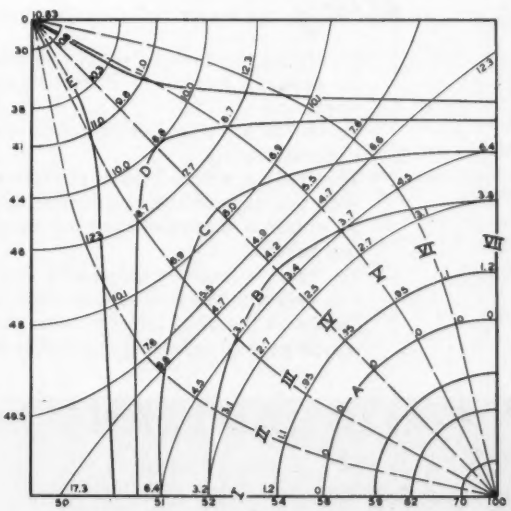

Fig. 1[3] — Computation of displacement front in a five-spot. Solid lines from 0 to 100 are equipressure lines. Dotted lines I to VII are flow lines. Numbers at intersections of solid and dotted lines indicate relative times, calculated from Equation 5 and added cumulatively from the point marked zero. Solid lines A, B, C, D, and E represent flood-front advance at the relative times marked 0, 3, 8, 6.4, 8.8, and 10.83, respectively

References

1. Electrical Model Studies of Secondary Recovery, Horner and Bruce, Supplement to Secondary Recovery of Oil in United States, 1942, A.P.I.

2. F. C. Todd, Application of Electrical Models to Flow Problems, third annual technical group meeting, Bradford District Research Group (1938) Mineral Industries Experiment Station, Pennsylvania State College, State College, Pa.

3. Wyckoff, Botset, and Muskat, Trans. A.I.M.E. 103, 1933, p. 230.

Series by Dr. John C. Calhoun, Jr., Chairman, Petroleum Engineering School, University of Oklahoma

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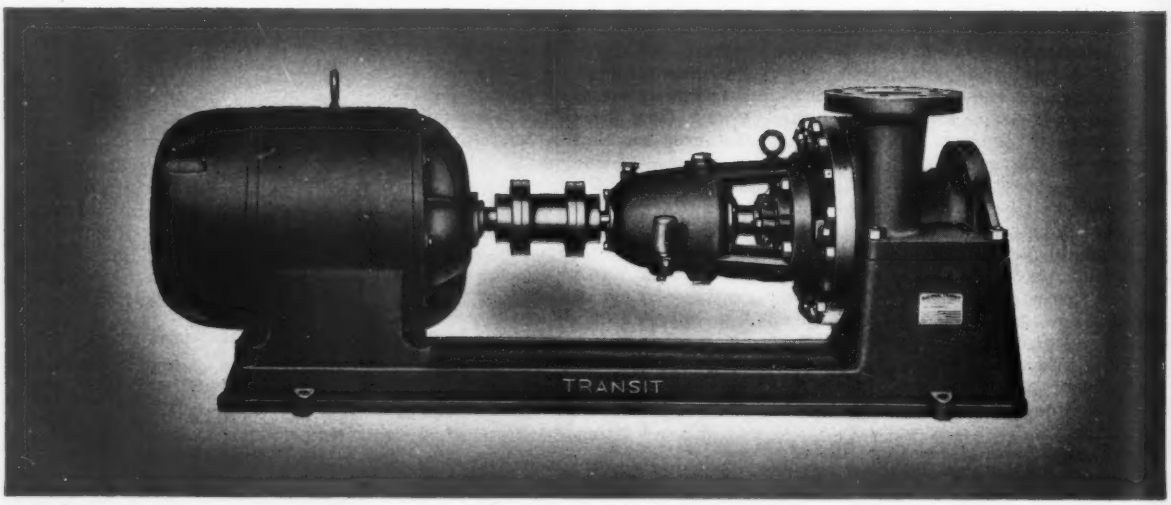

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Cost-imating

A WEEKLY FEATURE OF THE OIL ANG GAS JOURNAL

Furnace Details

APPROXIMATE COST INDEXES (1946 = 100)

	Material†				
	Brick and Tile	Cement	Structural steel	Castings	Refinery labor‡
1926	81	96	84	...	58
1928	78	89	80	...	57
1929	77	85	83	...	59
1930	73	86	73	...	57
1931	68	72	70	...	57
1932	63	71	68	49	48
1933	64	84	72	45	49
1934	70	89	77	43	55
1935	72	89	78	39	58
1936	72	88	80	47	60
1937	76	85	95	51	65
1938	74	86	93	72	67
1939	74	88	91	81	68
1940	73	87	90	84	69
1941	76	88	91	68	71
1942	80	90	90	68	79
1943	80	90	91	88	87
1944	83	92	90	86	90
1945	91	95	91	88	94
1946	100	100	100	100	100
1947	114	111	117	*160	119
1948	127	125	*148	*170	*154
1949	*125	*124	*134	*150	*150

*Estimated. †Wholesale prices (and indexes), Bur. of Labor statistics, U. S. Dept. of Labor. ‡Cost-imating No. 1, October 21, 1948, p. 141.

PIPE-STILL CONSTRUCTION ITEMS, 1946 COSTS

Material or item—	Unit	Costs, 1946 Material	Labor	M. & L.
Cast iron:				
General, header plates, etc.	ct. per lb.	9-15	3-4	12-18
Low-alloy iron castings	ct. per lb.	12-19	3-4	15-23
Explosion or inspection doors	each	50-70	15-20	67-85
Peep boxes	each	50-60	15-20	67-75
Tube supports, high temperature:				
16 per cent chromium	ct. per lb.	30-40	7	40-50
Chrome nickel	ct. per lb.	45-60	7	55-65
Burners:				
Oil, 5,000,000 B.t.u. per hour	$ each	100-170	30-40	135-200
Oil, 10,000,000 B.t.u. per hour	$ each	180-240	50-70	240-300
Oil	$ per M.M.-B.t.u.	19	7	26
Gas, 5,000,000 B.t.u. per hour	$ each	50-65	30-40	85-100
Gas, 10,000,000 B.t.u. per hour	$ each	85-120	50-70	140-180
Gas	$ per M.M.-B.t.u.	12.5	7	20
Combination	$ per M.M.-B.t.u.	26	8	34
Tube rollers, two sets with motor	$ each	530-600	.....	.....
Tube rollers, only cutter set	$ per set	130-170	.....	.....
Stack (insulation) lining	$ per sq. ft.	0.50	0.25	0.75
Steel:				
Structural	ct. per lb.	9-10	3-4	12-14
Stack (guyed in place)	ct. per lb.	14	3.5	17.5
Breeching	ct. per lb.	30	11.0	41.0
Grating for walkways	$ per sq. ft.	0.85-0.91	0.17-0.20	1.02-1.11
Stairway, complete	$ per ft.	.....	.....	18-45
Walkway with one rail, 48-in.	$ per ft.	.....	.....	6.60-12.60
Plate	ct. per lb.	.....	.....	11-14
Brick, common or red	$ per M.	18-24	45-55	65-75
Brick, fire clay	$ per M.	58-73	60-75	115-145
Brick, insulation	$ per M.	136-158	60-75	190-220
Tile, suspended roof, 10-in.	$ per sq. ft.	2.90	2.30	5.20
Tile, arch, 8-in.	$ per sq. ft.	3.10	2.50	5.60
Cement board, ¼-in. flat	$ per sq. ft.	0.26	0.10	0.36
Cement board, ½-in. flat	$ per sq. ft.	0.50	0.17	0.67
Cement board, ¼-in. corrugated	$ per sq. ft.	0.27	0.10	0.37
Mortar or cement:				
High-temperature, for fire clay*	ct. per lb.	4.5-5.5	.....	.....
Insulation*	ct. per lb.	5.0-6.5	.....	.....
Wall wash for seal*	ct. per lb.	9	8.5	17.5
Plastic firebrick or clay	$ per ton	58	.....	.....
Insulation behind headers*	ct. per lb.	6	.....	.....
Asbestos rope for joints*	ct. per lb.	36-39	8-9	44-48

*See Cost-imating No. 24 (March 31, 1949) for amounts of these materials required.

No. 26 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

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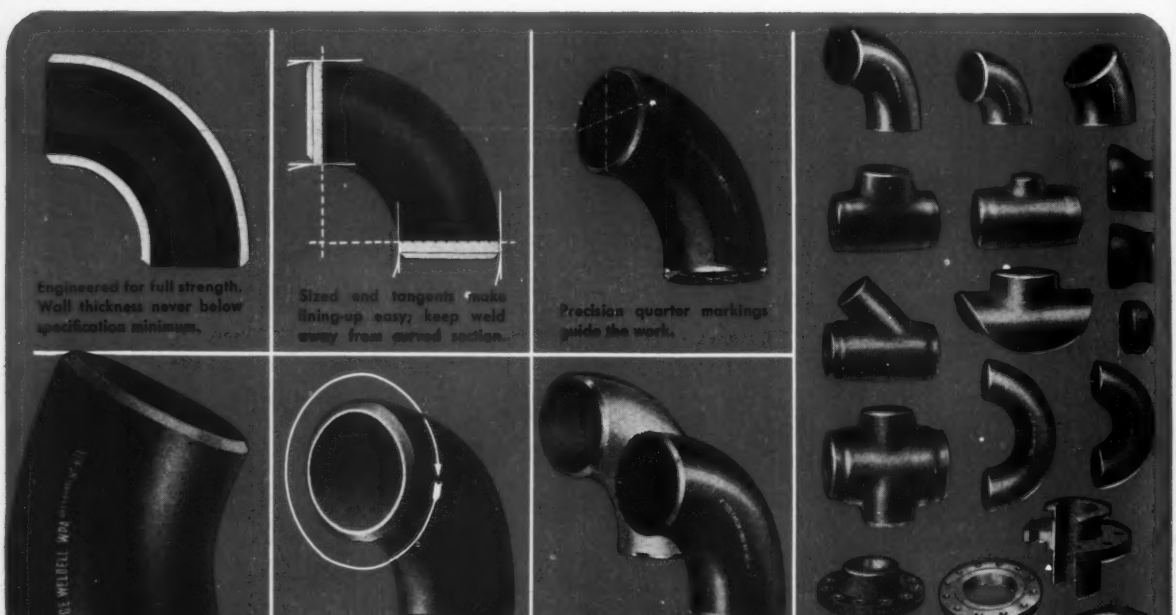
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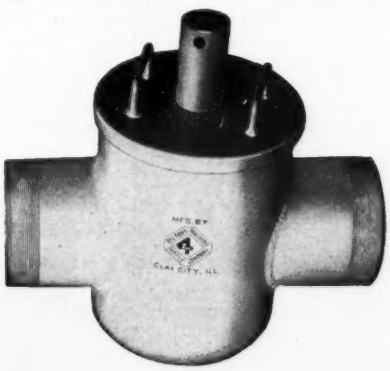
OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

by Dan B. Miller

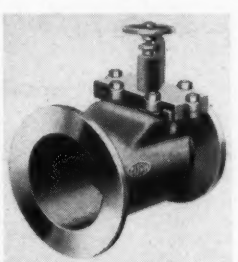
(1) SUCTION STRAINER for use on mud pumps, mud lines, and similar applications. Eliminates much lost time in shutting down pumps to clean out leaves, sticks, and



other foreign matter from slush pits. It is specifically adapted to the industry as it can be dismantled, cleaned, and reassembled in less than 10 minutes. It is composed of four parts, i.e. body, screen, cap, and nut. Strainer cap is equipped with hydraulic packing for making positive seal to body and nut also has hydraulic packing to seal on cap. *Big Four Machine & Supply Co.*

IT'S NEW CHECK IT

(2) DISCHARGE CHECK VALVES protect against contamination of liquids, fouling of pumps and equipment, reduce maintenance costs, and prevent production difficulties in industrial plants wherever back surge is a problem. These units serve an important function in discharge lines carrying steam, sludge, waste water, and many other waste liquids in gravity-flow installations. Units have a swing check flap suspended from a full-floating pin fulcrum to insure positive full surface contact between ground face of flap and flap seat. Available with 180°; 105° or 90° bodies made of cast bronze, steel, semisteel, cast iron, and alloy metals for corrosion resistance. *J. A. Zurn Manufacturing Co.*



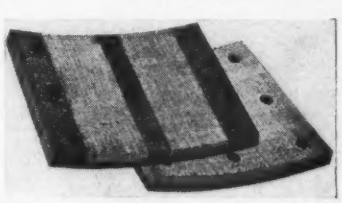
IT'S NEW CHECK IT

(3) DEEP-WELL CLEANOUT SPUDDER The 150 is an entirely new model, but it incorporates no feature that has not been long proved and perfected in the 50. Machine has a 42-ft. derrick, telescoping type, 28 ft. long in retracted position, with power-driven derrick raiser,

extender, and holding brake. Power unit is 54-hp. heavy-duty engine, operating at 1,800 r.p.m. Cable capacity is 1,650 ft. of ¾-in. line on either side of the divider for drilling. For cleanout, the full drum capacities are ⅝ in. —5,675 ft.; 9/16 in.—6,990 ft. Total weight, ready for truck mounting, is 15,600 lb., with catheads, calf reel, and derrick but without cables. *Keystone Driller Co.*

IT'S NEW CHECK IT

(4) MW BRAKE BLOCKS. This new development combines the qualities of woven asbestos and molded asbestos materials in proper balance for the specific application. Variation in the compositions and the proportions of the two materials provides adjustment of characteristics to the service. Quick, positive engagement of woven can be tempered with smooth, nongrabbing action of molded. The proper degree of flange conditioning can be provided to assure



The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

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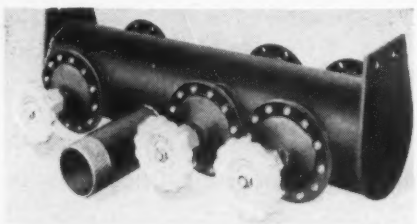
frictional stability and avoid glazing on any kind of flange. *Gatke Corp.*

IT'S NEW CHECK IT

(5) WARREN MANIFOLD VALVE. This special valve permits free flowing of oil and other liquid materials with less loss of head. Valve is constructed from sturdy

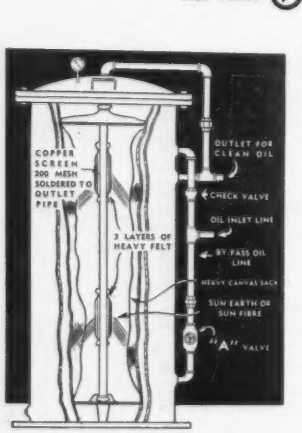


seamless-steel tubing and stampings allowing valve arrangements heretofore impossible. Has larger flow areas, permitting faster flow of materials. *Betts Machine Co.*

IT'S NEW CHECK IT

(6) LIGHTWEIGHT, PORTABLE SAFETY SLIDE which can be speedily rigged to a tower with 1-in. rope and simple anchor for use in oil fields, is equipped with a ratchet-type brake which may be set to hold it in readiness for instant use. By pulling brake lever, the user may control his speed on the descent completely, no matter what the angle. A form-fitting metal seat assures comfort and balance in operation. Weighing 16 lb., the unit can support load of 1,000 lb. It can be carried easily by a derrick man on the ascent. *B. F. McDonald Co.*

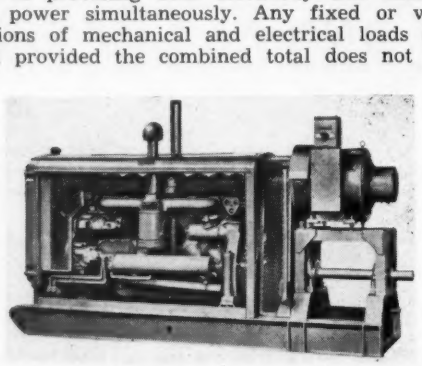
IT'S NEW CHECK IT


COPPER SCREEN 200 MESH SOLDERED TO OUTLET PIPE
OUTLET FOR CLEAN OIL
CHECK VALVE
OIL INLET LINE
3 LAYERS OF HEAVY FELT
BY PASS OIL LINE
HEAVY CANVAS SACK
SUN EARTH OR SUN FIBRE
"A" VALVE

(7) DUAL - FLOW OIL FILTER. The new bypass oil line accommodates simultaneous flow through the engine by use of relief valve and outside flow chamber and therefore does not build up a high pressure. The multishell construction permits heating the filter element by circulation of engine discharge oil which cools on leaving the annulus and before reentering the crank case. Filter uses fuller's earth as a medium. *Sun Engineering Co.*

IT'S NEW CHECK IT

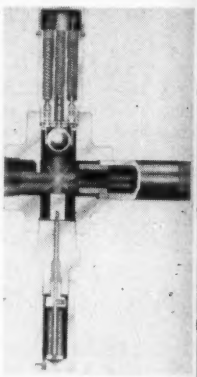
(8) MECH-ELEC UNIT. A packaged diesel power unit capable of providing both electricity and mechanical driving power simultaneously. Any fixed or variable proportions of mechanical and electrical loads can be handled provided the combined total does not exceed



the rated capacity of the engine, and that the electrical load does not exceed 50 kw. Generator can be operated without engaging mechanical drive. Two models are available, the ME-6, rated at 135 hp. continuous, 160 hp. intermittent and the ME-66, rated at 150 hp. continuous, 180 hp. intermittent. Both models are equipped with 50-kw. generators. The engine ratings indicate the total power available for mechanical output. *Murphy Diesel Co.*

IT'S NEW CHECK IT

(9) AUTOMATIC SHUTOFF VALVE is a double-acting safety valve that automatically closes against any predetermined high or low pressure. Installed on the christmas tree downstream from the choke, it protects the flow line and separator against excessive well pressure and prevents loss of fluid or gas from the well in event of line failure. The valve never exhausts supply gas or fluid to atmosphere. In event of an oil or flow line break, pressure in the line would drop and the valve would automatically shut off flow from well. Valve also permits all wells flowing into one central point to be shut off merely by opening one master control valve at the point of separation. *W-K-M Co., Inc.*



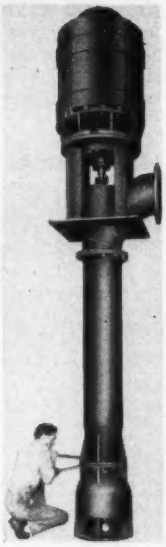
IT'S NEW CHECK IT

(10) FIELD HOUSING that provides employes with attractive and comfortable homes in the field. These houses can be built from your plans and specifications or you

can order your field housing from stock plan. Feature of this service is that an entire project can be handled on one purchase order. *Whitmor Homebuilders, Inc.*

IT'S NEW CHECK IT

(11) VERTICAL CIRCULATING PUMPS for cooling towers are grouped as smaller sizes from 5 to 12. in and as larger sizes above 12 in. Smaller sizes are available in capacities from 20 to 3,000 g.p.m. at heads required. The larger sizes are available in capacities of 1,500 g.p.m. and up at heads required. Designed primarily as cooling-tower pumps, these large vertical pumps are suitable to many heat-exchange applications where medium to high-capacity pumps are indicated. *Byron Jackson Co.*

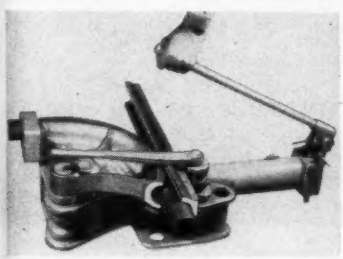


IT'S NEW CHECK IT

(12) IMPROVED DESIGN IN AGITATOR DRIVES. The new design which incorporated John Crane mechanical seals, eliminates leakage and protects products from contamination. The seal is standard equipment on Nettco drive models WT, T, TA, TB, and TAB and is available for these Nettco models now in the field. *New England Tank & Tower Co.*

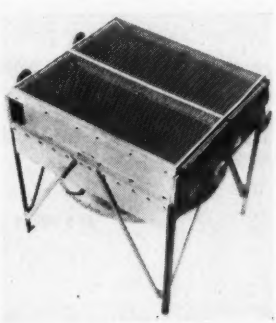
IT'S NEW CHECK IT

(13) PORTABLE THIN-WALL TUBING BENDER is primarily designed for EMT tubing; but is fully practical for hard-copper tubing, stainless-steel tubing, and thin-wall tubing of other commercial metals. Has only two parts which fasten together with a U-key. In action the machine is simple, fast, and accurate. Change-overs from one size of tubing to another are accomplished in seconds with lightweight aluminum formers; will handle all standard sizes of tubing from 1 to 2-in. diameters. *Tal Bender, Inc.*



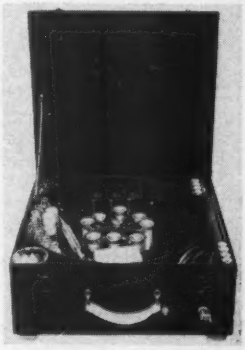
IT'S NEW CHECK IT

(14) WATER AND OIL-COOLING EQUIPMENT. Four new vertical air discharge models, called "HC" units, feature horizontal coils mounted above fans, each two coils requiring one fan and can be used for a combination of services. For example, the same two-coil unit can be employed for cooling both oil and water. Efficient radiator-type cores for water cooling or round-tube cores for oil cooling are standard equipment with all "HC" units. Coils for steam and vapor condensing and for gas cooling are also available. *Young Radiator Co.*



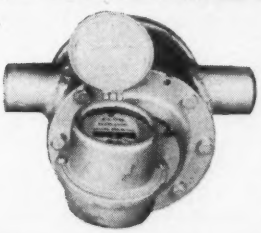
IT'S NEW CHECK IT

(15) LUBRICATING-OIL TESTING KIT. Aside from the speed with which tests can be made, the unusual feature of the new product is the accuracy of the results obtained by the relatively unskilled employe. The equipment kit, which is portable, measures the four dangerous classes of contaminants: change in viscosity due to fuel dilution or other causes; amount of the asphaltic and other oil-breakdown substances considered responsible for deposits; amount of dirt, metal particles, other solids and water; and acidity, showing whether corrosion is possible. *Gerin Corp.*



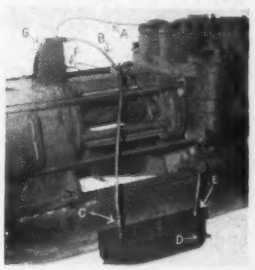
IT'S NEW CHECK IT

(16) FLOW INDICATOR is compact and complete with four blades mounted on a common shaft that serve to meter the passing liquid as they are actuated by the fliud flow. Each blade is compressed by a flat side or cam to facilitate an equal ejection between each blade. The blades are made of special rubber that has been engineered for this particular purpose and is oil resistant. Has only one moving part actuated by the fluid flow. In operation this part is self-cleaning and will operate in sludgy or paraffin-bearing fluids. *Flow Equipment Co., Inc.*



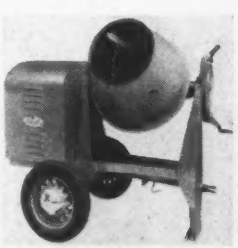
IT'S NEW CHECK IT

(17) PUMP-ROD LUBRICATOR efficiently and thoroughly lubricates the vital parts of pump rods, increasing life of rods from two to four times and will make packing last indefinitely. Sturdily built to stand rough oil-field usage, pump-rod lubricator will do the job under all pumping conditions. There are few working parts, no springs, gaskets or small parts to get out of order. Can be easily and quickly installed by any roughneck. The lubricant passes through the suction hose, into the lubricator, encircles pump rods, and returns back to the tank. *Golden Tool Co.*



IT'S NEW CHECK IT

(18) IMPROVED ECLIPSE 3½S MIXER embodies the latest in design and is guaranteed as to material and workmanship. Engine is completely enclosed in dustproof, weatherproof steel housing. Engine runs in oil and is controlled by throttling governor to insure constant speed and steady power. Main bearings are bronze, readily accessible. Sturdily built and easy to move, it is mounted on full-size tires for best road-ability. *George C. Christopher & Son Iron Works.*



TRADE LITERATURE

(19) SIMPLEX JACKS. An engineering data bulletin for industrial, oil, building, and bridge fields. Completely revised to bring all specifications and prices up to date, the new bulletin is designed for easy reference. *Templeton, Kenly & Co.*

(20) TUBULAR CALIPER SURVEYS for wells under pressure are explained in new four-page folder. Material describes an improved method of accurately measuring and recording the extent of corrosive pitting in tubular goods while in place in the well. Price list included. Illustrated. *Tubular Service & Engineering Co.*

(21) INSULINER. A four-page bulletin shows details of construction and gives instructions on estimating requirements, prices, and adaptability to field use. *M. H. Detrick Co.*

(22) CLYDE HANDI-CRANE is multicolor, four-page circular containing complete specifications and on-the-job illustrations of this tractor-mounted crane. *Clyde Iron Works, Inc.*

(23) FINNED HEAT-TRANSFER SURFACE explains details of construction and methods of fabrication employed to produce this equipment. *Aerofin Corp.*

(24) WALWORTH TODAY. A 16-page booklet illustrates products and explains a variety of applications. *Walworth Co.*

(25) REED ROTARY-DRILLING TOOLS. A loose-leaf bound catalog illustrates and evaluates all tools and equipment manufactured by the company. *Reed Roller Bit Co.*

(26) SAVES TIME . . . SAVES MONEY is a brochure suitable for inserting in binder on mobile combination radio-communication equipment. *General Electric Co.*

(27) SCOTT AIR-PAC explains operation and advantages of the various models of this breathing equipment for fire fighting. *Scott Aviation Corp.*

(28) HIGH-PRESSURE GAGES. A 32-page, fully illustrated catalog of the complete line of high-pressure gages and gage cocks including installation suggestions and cross-section diagrams. *Klingerit, Inc.*

(29) CESSNA 140, 170, AND 190 AND 195. Full color illustrations and complete specifications together with special features of their aircraft are listed in these attractive folders. *Cessna Aircraft Co.*

IT'S NEW ✓ CHECK IT

(30) FLO-KLEAN FILTERS, an eight-page, illustrated brochure gives complete technical data, examples of applications, and flow table on these large filters designed for process water as well as other applications requiring quantity filtering. *Cuno Engineering Corp.*

(31) VERTICAL SWING HORIZONTAL CHECK VALVE. An illustrated bulletin describing in detail the swing check valve and the triple-action safety quick-closing valve, designed to protect gasoline plants, refineries, and comparable plants against fire. Includes sectional drawings, installation views, complete descriptions and prices. *Falcon Products, Inc.*

(32) FLAT-LACED WIRE-ROPE SLINGS, contains illustrations of many actual installations in a wide field of operations and of loads in various sizes, shapes, and weights. *A. Leschen & Sons Rope Co.*

(33) SECTIONAL DRIVE GROUPS. A temporary, illustrated 16-page bulletin on Ideal type AS sectional drive groups for engines in the 300-hp. range to be used with types 75, 100, and 125 Consolidated drilling rigs. *National Supply Co.*

(34) EFFECTIVE NEUTRALIZATION OF INDUSTRIAL WASTES. A 20-page, fully illustrated bulletin shows how numerous oil refineries, chemical works, and other plants are effectively combating stream pollution through the use of standard pH equipment which automatically controls the neutralization of waste. *Leeds & Northrup Co.*

(35) E-M SYNCHRONIZER. New 16-page publication contains valuable information on how to select a.c. generators, paralleling a.c. generators, boosting capacity to meet electric-power demand, and applying packaged generators in industry. *Electric Machinery Manufacturing Co.*

(36) TAILOR-MADE IRONS. The possibility of selecting a type of gray iron to meet the requirements of a product are skillfully illustrated in a new 32-page booklet. *Frank Foundries Corp.*

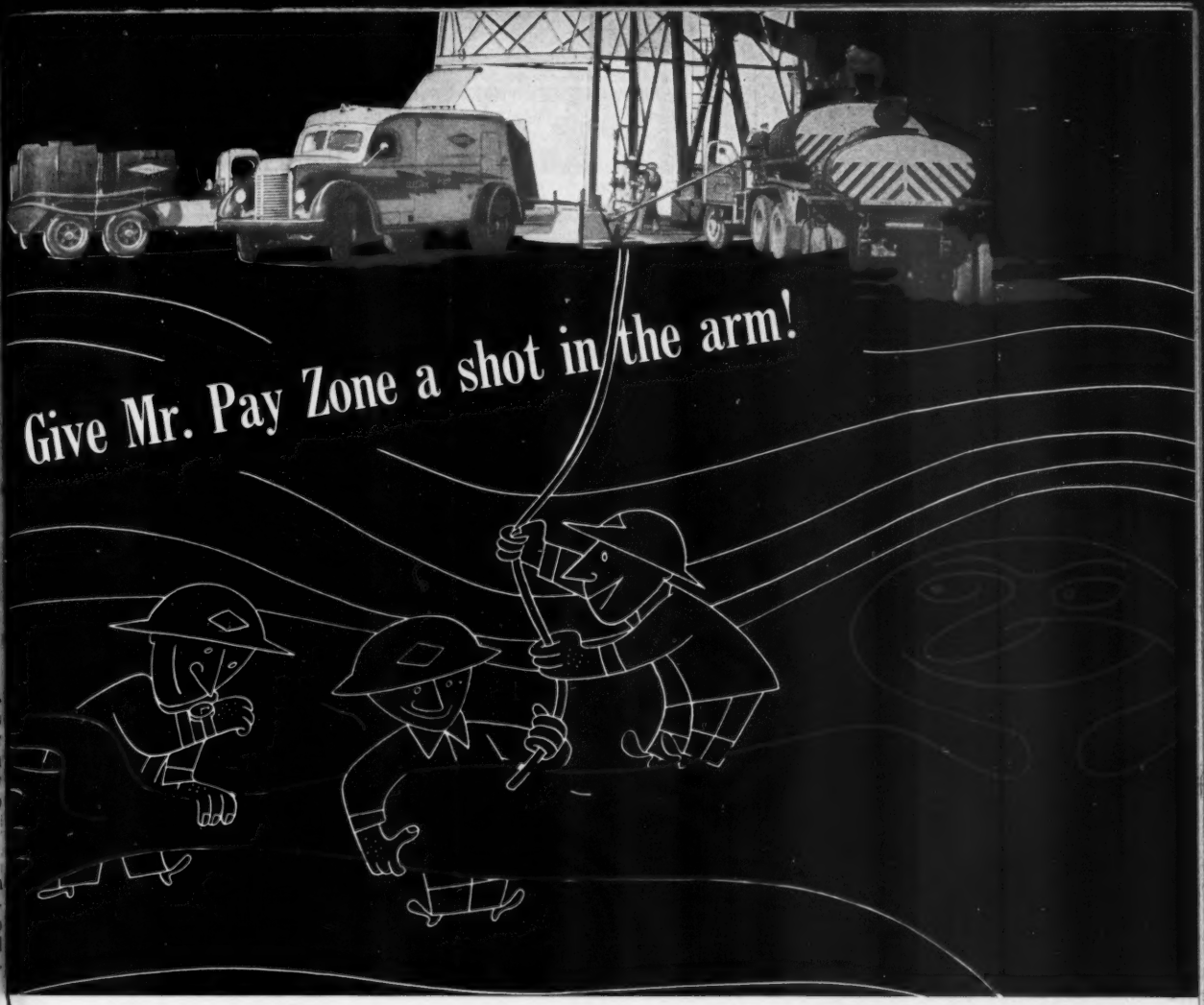
(37) AUTOMATIC CONTROLS. This catalog is complete in technical detail and shows just what control to select for individual needs and how to install and service it. *Synchro-Start Products, Inc.*

(38) PISTON RINGS AND VALVE DISKS. Folder describing the range of sizes and design of piston rings and valve disks for pumps and compressors. Gives characteristics of each product. *Tri-State Manufacturing & Engineering Co.*

IT'S NEW ✓ CHECK IT

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

Keep Informed. Save Time. Tear Out Card. Check It. Mail It.



Dowell Selective Acidizing puts the acid where you want it!

To get more oil from your wells, acid treatments should be directed accurately into selected zones. Look to Dowell for this service—*selective acidizing*, using the Electric Pilot.

Drawing on experience gained in acidizing thousands of wells, Dowell engineers work with you, correlating an Electric Pilot permeability survey with other well data, to determine the zones which should respond to treatment. Then, with the aid of the Electric Pilot, they *acidize just those zones*. For example: A north Texas well was producing ½ barrel of oil per hour and had a gas-oil ratio of 20,000 to 1. After selective acidizing, the well produced 50 barrels of oil per hour, and the gas-oil ratio was reduced to 500 to 1!

Selective acidizing is advantageous in most old wells, particularly those with residual oil to be recovered from tight sections; those with high gas-oil ratios, intermediate water zones or leaking casing seats; and those plugged back from bottom water or deepened to new pay zones. It is of value for new wells with saturated zones of varying permeability or those with a change of formations within the open hole.

Ask for your copy of the booklet describing all the Dowell Electric Pilot Services.

DOWELL INCORPORATED
TULSA 3, OKLAHOMA
Subsidiary of The Dow Chemical Company

DOWELL
SELECTIVE ACIDIZING

Ask your nearest Dowell Station for complete information on these Dowell services and products: Acidizing, Electric Pilot Services, Plastic Service, Chemical Scale Removal Service for heat exchange equipment, Jelflake, Paraffin Solvents, Magnesium Anodes for Corrosion Control and Bulk Inhibited Hydrochloric Acid.

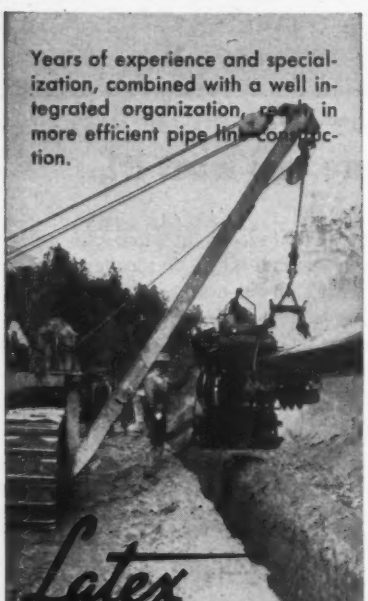
"Petroleum Promotes Progress"

Look to **DOWELL**

FOR OIL INDUSTRY CHEMICAL SERVICE

CRC
PIPE LINE CONSTRUCTION EQUIPMENT
CRUTCHER-ROLFS-CUMMINGS, INC.
Pipe Line Equipment and Materials
Houston - Tulsa

Years of experience and specialization, combined with a well integrated organization, results in more efficient pipe line construction.



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General Contractors
Oil • Gas • Gasoline • Water Pipelines
HOUSTON, TEXAS ATLANTA, GA.
L. H. Favrot — G. A. Peterkin — J. W. Sharman

PIPE LINES

Texas Gas Co. Announces Contracts for New Line

Texas Gas Transmission Corp.'s Owensboro, Ky., office has announced awarding of contracts for laying the major part of the 800-mile, 26-in. Carthage, Tex. - Middletown, Ohio, line, for which Federal Power Commission authorization has recently been granted.

N. A. Saigh Co. will lay the section between Carthage field, Texas, and Lisbon, La.

Latex Construction Co. has the contract from Lisbon, La., to a point on the Mississippi River below Greenville, Miss.

O. C. Whitaker Co. will build from the Mississippi River crossing to Lula, Miss.

J. R. Horrigan Construction Co., Inc., will have two spreads in the section between Memphis, Tenn., and Slaughters, Ky.

Williams Brothers Corp. will have two spreads working on 166 miles in the section from Slaughters, Ky., to a point on the Ohio River below Owensboro, Ky. One of the spreads will be under W. O. (Jack) Poston, superintendent, with headquarters at Hardinsburg, Ky. The other spread will be supervised by O. L. Martin; his field-office location has not been determined.

Midwestern Constructors, Inc., will build 80 miles to Lebanon, Ohio, where the line will connect with the system of Texas Eastern Transmission Corp. R. E. Stanley, superintendent, will have charge of this work in Indiana and Ohio.

Stone & Webster Engineering Corp. will build compressor stations. All construction will be supervised by L. E. Ingham, vice president of Texas Eastern.

The 63-mile Lula, Miss. - Memphis section was built in 1948.

Transcontinental Tests Double-Jointing Plants

In preparing for construction of the Transcontinental Gas Pipe Line Corp. 1,800-mile line, Ray L. Fish, Fish Constructors, Inc., is currently testing the possibilities of achieving a saving of several million dollars for the entire project by the practice of double-jointing 30-in. pipe in 31½-ft. lengths to furnish 63-ft. joints for stringing and field welding on the right-of-way.

By reducing field welds from 170 to 85 per mile, the number of field welders will be reduced one-half. The rate of spread construction in the field is expected to be increased at least 15 per cent because more pipe per day can be laid. Economies will be achieved in stringing and welding. Furthermore, application of submerged arc welding in double-joint-

Double jointing to make 63-ft. sections for Transcontinental Gas Pipe Line Corp. at Shamrock Construction Co. yard at Collins, Miss., where 30-in. pipe (below) is first rolled to stringer-bead welders before final automatic submerged arc welding (inset, left)

"Everything for the Pipeliner"

PIPE COATING and WRAPPING MACHINES
Stationary and Line Traveling

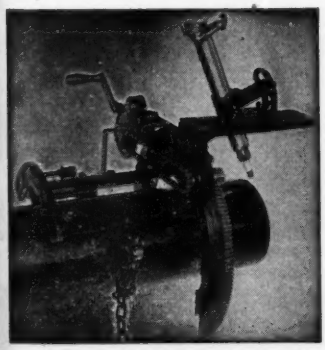
PIPE CLEANING and PRIMING MACHINES
Stationary and Line Traveling

American Steel Works
HEATING KETTLES

PIPE LINE SUPPLIES AND EQUIPMENT

PERRAULT Brothers INC.
1130 NORTH BOSTON
TULSA 6, OKLAHOMA
Phone 5-1104

Cut & Bevel Any Pipe
With
Maximum SPEED
Minimum COST



The H & M PIPE CUTTING and BEVELING MACHINE for 2 to 36-in. pipe

SPEED: Complete cut and bevel can be made on 12 inch pipe in about 2 minutes.
ECONOMY: Save approximately one-half labor and gas costs.
PORTABILITY: Can easily be carried from one pipe section to another.

Write for literature

The H & M
Pipe Beveling Machine Co.
311 East Third Street, Tulsa, Oklahoma

ing will make it possible to reduce dependence on the human element in welding operations and to improve the quality of welding.

Demonstrations of the application of submerged arc welding for this procedure are being conducted at two plants contracted by Fish which are operating in Mississippi. Each plant has contracted double jointing of 15 miles. Both plants run a stringer bead by all-position welding with the pipe stationary, followed by submerged arc position welding with the pipe rotated.

Midwestern Constructors, Inc., Columbia, Miss., plant uses the Lincweld (Lincoln Electric Co.) semiautomatic submerged arc process on two parallel assembly lines constructed for the location.

Shamrock Construction Co., Collins, Miss., applies the Linde Air Products Co. Unionmelt, fully automatic submerged arc welding process with a different type of plant furnished by M. J. Crose Manufacturing Co. as a "packaged unit" including pneumatic turning and conveying equipment which may be readily moved from one position to another in the yard, with only 3 hours' moving time. This facilitates rolling pipe to the job on skids and cuts down crane work. The entire plant is salvable for transportation to another location.

It is reported that, once a normal output rate of production was established, Shamrock has been making 40 to 100 welds daily with a 50 to 70-weld rate regarded as good production.

Bids are being taken this week for a double-jointing operation to serve each of six 100-mile spreads about to be contracted by Fish for the Transcontinental project program this year.

Shell Pipe Line Projects Will Soon Be Completed

HOUSTON.—Two major pipe-line projects of Shell Lipe Line Corp. are expected to be in full operation by June 1949, according to T. E. Swigart, president of the firm.

The two lines include the 500-mile Ozark pipe line from Cushing, Okla., to Wood River, Ill. (Shell has a 55 per cent interest), and the Basin pipe line from Jal, N. M., to Cushing, Okla. (Shell has one-third interest).

The new lines will provide continuous transportation of crude oil from New Mexico, West Texas, and Oklahoma, to Wood River, where Shell has a 100,000-bbl. daily refinery.

The 20 and 22-in segment of the Basin line, from Jal to Wichita Falls, Tex., has been in operation since last July and the 24-in. segment extending into Cushing is expected to be completed in May.

With the successful crossing of the

View of Pipe Line Service plant at Franklin Park (Chicago suburb), Illinois, where development of better equipment and methods for pipe protection is constantly in progress.

EXPERIENCE MEANS BETTER PIPE PROTECTION

Since 1931, Pipe Line Service has specialized in the application of pipe protection materials on steel pipe for underground service.

The outgrowth of this experience is a pipe protection service offering outstanding features that are unique in the industry.

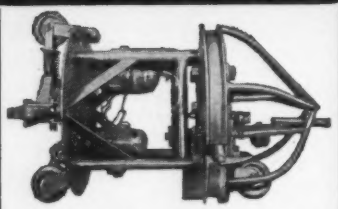
For example, Pipe Line Service maintains a sizeable staff of engineers who devote their entire efforts to developing new and better pipe coating equipment.

Then, too, Pipe Line Service operates a fully equipped machine shop and assembly plant for the sole purpose of building and servicing PLS equipment.

These are some of the reasons why you get more for your money in pipe cleaning, priming, coating and wrapping when you call on Pipe Line Service experience to protect your pipe. Six strategically located plants serve pipe users on gathering, transmission and distribution lines.

PIPE LINE SERVICE CORPORATION
General Offices and Plant:
FRANKLIN PARK, ILL.
Plants at: Glenwillard, Pa.; Longview, Tex. Corpus Christi, Tex.; Harvey, La.; Sparrows Point, Md.

CROSE
ELECTRIC MODEL
INTERNAL LINE-UP CLAMP



The electric model shown above is a rugged, heavy-duty clamp, electrically operated for the tough jobs.

ADVANTAGES:

For The Owners:
Better stringer bead; better finish weld; better pipe line.

For The Builder or Contractor:
Speed; stringer bead cut-out eliminated; economy; swabbing and alignment with one tool; less labor required.

Available for pipe sizes 12" through 36"
Rental or Outright Sale Basis

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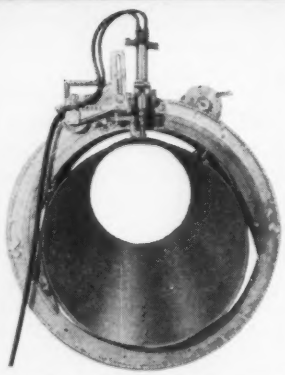
MANUFACTURING COMPANY, INC.
MAIN OFFICE
2715 DAWSON RD. TULSA, OKLA.
BRANCH OFFICE
M & M BUILDING HOUSTON, TEX.

CROSE
PIPE CUTTING AND BEVELING MACHINE



EQUIPPED WITH OUT-OF-ROUND ATTACHMENT

Machines to cut and bevel 16" pipe and over are furnished with out-of-round attachment. Machines to cut and bevel 14" pipe and under are furnished with standard torch holder.

M. J. CROSE
MANUFACTURING COMPANY, INC.
MAIN OFFICE
2715 DAWSON RD. TULSA, OKLA.
BRANCH OFFICE
M & M BUILDING HOUSTON, TEX.

Missouri River *(see The Oil and Gas Journal, March 24, page 305)*, the greatest obstacle involved in the laying of the Ozark Pipe Line System was overcome. Other difficulties have already been surmounted, such as the crossing of the Ozark Mountains, and many rivers, and the laying of pipe in winter weather across difficult types of terrain.

For the manufacture of the 93,000 tons of 22-in. pipe, it took 85 days of continuous mill operations; transportation of this pipe an average of 700 miles to the scene of construction involved the dispatch of a 60-car train every 36 hours.

Texas Eastern Awards Contract for Ohio Loop

Texas Eastern Transmission Corp. let contract for a 60-mile, 26-in. loop to Williams Brothers Corp. A spread under the supervision is moving into eastern Ohio where a field office has been established at Woodsfield.

The Williams Brothers organization has recently contracted with Manufacturers Light & Heat Co. and Home Gas Co. for laying 86 miles of 6, 8, 10, and 12-in. line. The spread under J. A. Humphries is working from a field office at Port Jervis, N. Y. This contractor is preparing to move a gang to Minneapolis for summer work for Minneapolis Gas & Light Co. At Atlanta, 5½ miles of 24-in. has been laid by this organization for Atlanta Gas Co.

Motor-Fuel Shipments via Pipe Lines Show Big Gains

Bureau of Mines reports that shipment of motor fuel by pipe lines in January 1948 increased 16.1 per cent over January 1947, and proportion of fuel handled to total output also continued to exceed last year's figures.

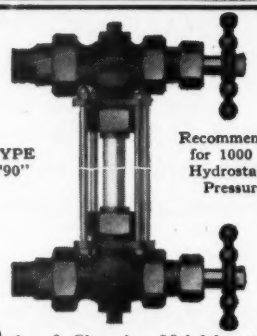
Motor fuel turned into lines during the month of January totaled 28,406,000 bbl., an increase of 3,961,000 bbl., or 16.1 per cent from January 1948 and a gain of 365,000 bbl., or 1.3 per cent from the preceding month.

Motor fuel delivered from lines during January totaled 26,642,000 bbl., or a gain of 2,803 bbl., representing a gain of 11.8 per cent from 1947 during the same month. Ratio of motor fuel turned into pipe lines to total motor-fuel production in January was slightly more than 35 per cent, and ratio in January 1947 was 33.2 per cent. Ratio for 1948 was 31.8 per cent.

Socony Completing Spur

Socony-Vacuum Oil Co., Inc., is completing this week the laying of the 22-mile, 6-in. spur line in the Reading, Pa., area to serve the company's products system. Construction has been handled by Midwestern Constructors, Inc.

PENBERTHY
DROP FORGED STEEL
LIQUID LEVEL GAGES



Made of Chromium-Molybdenuin alloy temperature resisting steel, extra heavy throughout and stainless steel trimmed. Positive automatic shut-off; stainless steel balls shut off the flow of liquid if glass breaks. Regrinding removable seats, heavy duty stuffing boxes, union connections. Conform with A.P.I.—A.S.M.E. requirements.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

TO REPAIR PIPE LEAKS—
QUICKLY, PERMANENTLY
ANY PRESSURE — ANY TEMPERATURE

SKINNER-SEAL EMERGENCY PIPE CLAMP
for pinhole or corrosion leaks.

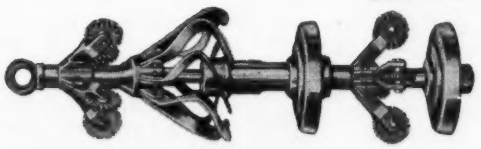
SKINNER-SEAL PIPE LINE CLAMP for long splits and bad corrosion leaks.

In stock—all oil well supply stores

M. B. SKINNER COMPANY
SOUTH BEND 21, INDIANA, U. S. A.

Keep your pipes clean!

NORTHRUP GO-DEVILS



Disc-Cup Model — Size 6"

Sound design and top quality make Northrup Go-Devils clean thoroughly and last long.

Northrup Go-Devils are priced lower than others; yet they serve better and longer.

Every order shipped the day received

WASHINGTON ENGINE & PUMP CO.
Box 372, Washington, Pa.

Important TO HEALTH AND EFFICIENCY

COOL, PURE DRINKING WATER . . . ON THE JOB

Dobbins Portable Sanitary Drinking Fountain

Assures an adequate supply of cool, pure drinking water for workers *everywhere*—in factory or field. Protects their health, and keeps them on the job. Fountain has inner water container of stainless steel. Four gallon tank is fully insulated. Constant air pressure for instant flow of water is furnished by a few strokes of the pump at widely spaced intervals. *Operates at the press of a button*, like any bubbler drinking fountain. May be easily carried from place to place by shoulder strap, or mounted on truck, tractor or locomotive.

Banishes germ-spreading cups, dippers, pails.

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Serving With

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HELDT TRUCKS

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★ MOTOR GRADERS

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SERVING TEXAS OILFIELDS
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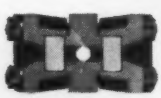
PENBERTHY
"TRANSPARENT"
DROP FORGED STEEL
LIQUID LEVEL GAGES

Used to observe color and density of liquids under high pressures and/or temperatures. Construction exceptionally sturdy. Made of alloy temperature resisting steel, and are highest quality throughout. Liquid chamber made from solid block of steel to assure perfect alignment and rigidity. Conform with A.P.I.—A.S.M.E. requirements.

The "Transparent" is one of the complete line of Penberthy gages that meet every liquid level gage requirement.



PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

New and Exclusive

CUT-AWAY SECTION

Equipoise POROUS Stainless Steel
PRESSURE SNUBBERS

These new snubbers utilize a porous stainless steel disk as the primary element to eliminate pulsations. They can be used to protect all types of pressure sensitive instruments. Namely, pressure gauges; pressure indicating and recording controllers; diaphragm type differential meters; U-tube manometers; differential flow meters; pump governors; and diaphragm regulators. They also can be used as filters or as flow meters on small flows.
The porous disk is made in several standard Grades. Special grades made to suit application.
Grade "G" Air, gases, Butane, gasoline.
Grade "E" Water, kerosene, light oils, etc.
Grade "D" Oil, etc., having viscosity over 300 SSU.
Write for literature — Dept. OGJ

EQUIPOISE CONTROLS
INCORPORATED
100 STEVENS AVE., MT. VERNON, N. Y.

REFINING

American Mineral Shuts Down Corpus Refinery

HOUSTON. — American Mineral Spirits Refining Co., Chicago, has discontinued operation of its Corpus Christi refinery and closed the company's offices in that area "because of economic conditions in the industry."

Although pay of employes was terminated last week, the plant was placed on a standby basis. When the plant would reopen would depend on the petroleum-products market, John A. Bartlett, vice president and general manager, said.

The Corpus Christi plant, although having a crude-oil capacity of 13,000 bbl. daily, averaged 8,000 bbl. daily for its crude runs last year. It has no cracking facilities. The plant processed Southwest Texas sweet crudes produced in the Corpus Christi area.

The plant last year produced 1,200,000 bbl. of motor gasoline, 1,400,000 bbl. of heating oil, and 600,000 bbl. of residual-fuel oil. Its products were shipped by tanker to the East Coast and Europe, generally, although a small amount for domestic consumption was moved to Corpus Christi by tank car.

There was no indication that other refineries operating on the ship channel were planning any drastic curtailment of their output. Sinclair Refining Co., which has a crude-oil capacity of 21,000 bbl. daily and a cracking capacity of 20,000 bbl. daily, has cut its production while repairs on the plant are under way. However, E. B. Killick, refinery superintendent, said that the plant is expected to return to its normal output as soon as the repairs are completed.

Labor-Cost Increase Halts Phillips Refinery Program

Workmen on Phillips Petroleum Co. refinery project at Kansas City, Mo., have been notified that the $10,000,000 expansion program was being halted indefinitely. Announcement, issued by C. F. Braun & Co., principal contractor, made no mention of any possibility that work might be resumed at a later date.

W. W. Keeler, vice president in charge of refining operations for Phillips, declined to comment on the order, and refused to speculate on what might be done with the facilities already constructed.

L. I. Blennerhasset, Braun field director at Kansas City, said between 750 and 800 men on the project were being given the dismissal notices. Reports indicated the shutdown was the result of increased labor costs, stemming from new contracts negotiated with A. F. of L. building-trades unions. The construction firm had requested a union agreement to continue the Phillips job at the former rates.

The refusal of the unions to make any exception for the Braun company led to the action on the Phillips project, it has been reported.

Oxygen-From-Air Process Meets Tests Successfully

A new process for producing low-cost oxygen from air has been successfully tested commercially for the first time. Start-up runs have been completed at a chemical plant at Winnie, Tex., and the plant has been producing in excess of 200 gross tons per day of 90 per cent oxygen for the synthesis of methanol, formaldehyde, and other petrochemicals.

The plant at Winnie is presently the world's largest single commercial installation, but it will be dwarfed by a second plant utilizing the new process, which will be operating later this year with a capacity of 2,000 tons per day of oxygen. It is being built for Carthage Hydrocol Corp., Brownsville, Tex.

In large quantities, the process, developed by Hydrocarbon Research, Inc., can make oxygen available for such industrial uses as steel making, synthetic-fuel production, and many chemical processes at a low cost, and this low price makes it practical to consider it along with steam and electric power as an industrial utility, its perfectors claim.

Tulsa Firm Making 420 Tons Of Sulfuric Acid Daily

A Tulsa concern, Ozark-Mahoning Co., is now producing approximately 420 tons of sulfuric acid per day, or roughly 1 per cent of the nation's output, it has been revealed. The plant ships the product to refiners in the Mid-Continent, as well as other areas, where it is used to remove sulfur impurities, and also used to make ammonium sulfate.

The plant makes the acid by "contact" process, in which large piles of sulfur stored outside the plant are first burned in air to form sulfur dioxide, which is then "contacted"

with a catalyst to cause the sulfur dioxide to form sulfur trioxide, by combining with even more oxygen. This gas is then dissolved in water, which already contains some sulfuric acid, to produce a very concentrated product. In this form acid is not very corrosive, so that it can be shipped in ordinary steel tank cars.

Socony-Vacuum Announces New Oil, Improved Waxes

Socony-Vacuum Oil Co., Inc., has announced a new motor oil, which it describes as a "heavy-duty type which has exceptional oxidation resistance and chemical stability, powerful detergent action and a high viscosity index assuring optimum viscosity at all operating temperatures;" and a new line of microcrystalline waxes "substantially improved over conventional waxes with particular respect to toughness, adhesiveness, and flexibility at low temperatures."

The new oil is said to be compounded entirely of high grade, solvent-extracted base oils and extremely efficient additives, resulting in a heavy-duty lubricant of greatly improved performance. It is the result of a 3-year program of research and tests.

The waxes are designed especially for paper and paper-covering industries, because low temperature flexibility makes them unusually useful in applications such as frozen-food packages, and locker papers. In all cases, lower moisture-vapor transmission is expected because the new product will resist fracture and will tend to preserve continuous moisture-vapor resisting films. It is available in amber and brown, and is known as "S/V Magnowax."

Indiana Standard's Sugar Creek Refinery Gets Award

The Distinguished Service to Safety award of National Safety Council has been presented to Standard Oil Co. (Ind.) Sugar Creek refinery employes, for working nearly 14 months without loss of time or disabling injury because of accident. The award entitles the plant to fly the council's "S" pennant for safety.

The refinery's safety record, which won the award, covered 1 year, 1 month, and 21 days from October 2, 1947, to November 23, 1948. During this time the 1,237 employes worked 2,669,039 man hours without loss of time or disabling injury because of accident.

Pennsylvania-Grade Crude Qualities Are Discussed

Spokesmen and technical advisors for 11 refiners of Pennsylvania-grade crude oil reviewed extensive data on what they termed "superiority" of Pennsylvania motor oils in automotive service, at a meeting held in Oil City, Pa., April 7.

One of a series being held under auspices of Pennsylvania Grade Crude Oil Association, the meeting was devoted to material submitted at the conference covering low consumption afforded by Pennsylvania oils, advantages of their natural high viscosity index as proved by field tests, and their chemical stability.

H. A. Logan, United Refining Co., Warren, Pa., presided as chairman of the meeting.

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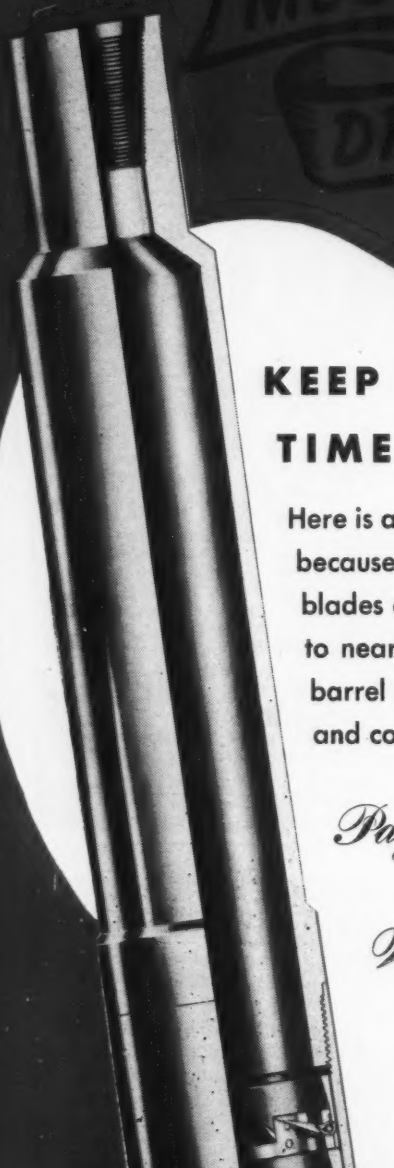

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Among the Drilling Contractors

More American Contractors Enter Western Canada Play

The number of American drilling contractors operating in western Canada continues to increase. Latest to enter the active play under way in that region include: Fred M. Manning, Inc., Denver; Arrow Drilling Co., Tulsa; Al Buchanan Drilling Co., San Antonio; Ira Van Tuyl, Evansville, Ind., and Robinson-Matheny Drilling Co., Wichita Falls, Tex.

The first two companies have contracts to drill for British American Oil Co., Ltd., and Hudson's Bay Oil & Gas Co. on a Crown reserve lease, owned jointly by the latter two operators, in the Redwater area northeast of Edmonton.

Al Buchanan Drilling Co. is moving in a heavy-duty power rig to drill a wildcat test for Amerada Petroleum Corp. at a location about 65 miles east of Calgary. The rig has been operating in Wyoming the past year.

Location for the first well to be drilled by Van Tuyl has not been announced. A partner in the V-T Drilling Co. at Evansville, he will operate in Canada as Lodestar Drilling Co., a newly organized company with headquarters at Calgary.

Robinson-Matheny Drilling Co.'s first Canadian venture will be a wildcat test for McColl-Frontenac Oil Co., Ltd., in the Telfordville area, 16 miles west of Leduc field. Location is in LSD 16, 11-50-2w5.

Drilling Firm Changes Name

Name of Mealy-Wolfe Drilling Co., Tulsa, has been changed to Wolfe Drilling Co. The change has been occasioned by the death last December of S. R. Mealy, who with W. W. Wolfe, organized the company in 1942. Principal offices will be continued at 1108 Hunt Building, and field offices at Seminole, Okla.

New Drilling Firm Formed

Noland Drilling Co., Inc., is a newly organized drilling contracting company. Partners and incorporators of the company are Roger B. Randolph, Robert L. McGowen, and Joe Holliman of Tulsa.

Parker Drilling Co., Tulsa, is starting a wildcat test for Canadian Gulf Oil Co. in LSD 4, 10-38-20w4, about 95 miles north and east of Calgary Alta., Canada.

Loffland Brothers Co. is the contractor for Sun Oil Co. on its Pipestone Creek wildcat in LSD 5, 11-47-24w4, in Alberta Province, Canada. Location is about 20 miles southeast of the Leduc field.

Drilling Firm's First Job Finds New Montana Field

Big Chief Western Corp.'s first contract job, a wildcat being drilled for British American Oil Producing Co. on the Clark Fork structure, Carbon County, Montana, is giving promise of opening a new field. In a drill-stem test of the Tensleep sand at 9,028-9,101 ft. it recovered 1,688 ft. of oil and gas-cut mud, which treated out 40 per cent oil. Location is C NE NE 26-9s-22e, 2 miles north of the Wyoming line on the western edge of the Big Horn basin.

The corporation is headed by W. T. Payne, president of Big Chief Drilling Co., Oklahoma City, and was organized to operate in the Rocky Mountain region. "Rube" Hunt is in charge of drilling operations.

Ford Oil Co. will drill Basin Oil Co. 1 Eugene W. Moore, NE NW NE, Section 35-3n-12w in Allegan County, Mich.

Big Chief Drilling Co. has contract for Bay Petroleum and Ivan Otstot 1 Frank Parkes, NE NE SW, 34-4n-8e, east of Willowbar, Cimarron County, Oklahoma.

Delta Drilling Co. has contract for Lone Star Production Co. 1 Henry Butler in a 25-acre tract in John Belcher Survey, Willow Springs area in Gregg County, Texas.

Graham & Clarence will drill their own 1 Glenn Anderson, NW NW NW 8-9n-10e, in Lapeer County, Michigan.

Camay Drilling Co., Los Angeles, is drilling a deep exploratory test in the Estrella area, California. Location is on the Henry Kirschenman land in 28-25s-12e. At latest report it was drilling below 3,900 ft.

Graham-Powell has drilling contract for Gulf Refining Co. 1 Foltz, wildcat in NW NE 19-6n-9e, Jasper County, Illinois.

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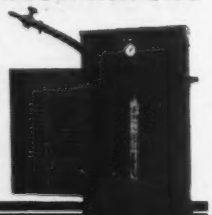

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Dan L. Clark Drilling Co.
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DAN L. CLARK DRILLING CO. is headquartered at 1101 Wilson Building, Corpus Christi, Tex. Officers include W. M. Averill, Dan L. Clark and Rupert Cox.

History.—The company was organized in 1939, beginning operations with only one small rig. Its first contracts were in Driscoll field, Nueces County. Present active equipment includes one power and two steam rigs capable of drilling to depths of 9,000 ft. All, currently, are working in the Lower Gulf Coast region.

Personnel.—General superintendent is C. B. "Buck" Johnson. Tool pushers and their length of service with the company are: L. F. Thompson, Victoria, Tex., 9 years; Earl Blanton, also of Victoria, 4 years, and W. M. "Skinny" McClure, Kingsville, Tex., 3 years.

Sidelights.—Among the more important discovery wells drilled by the company were those for Minnie Bock field, Nueces County, and West Pridham Lake field, Victoria County.

R. D. Evans & Son will drill Norman L. Stevens 1 Monk, NW NE SW 26-1n-16w, Van Buren County, Michigan.

Penrod Drilling Co., Shreveport, has contracted with Nelson Hunt and Richard King, Jr., to drill 1 Daisy Barr, a projected Ellenburger test, a wildcat location ½ mile west of Millersview, Concho County, West Central Texas.

W. C. Patton, Stillwater, Okla., is the drilling contractor for T. N. Berry & Co. on its 1 Fisher, SE NE NE 24-19n-3e, a new wildcat test in Payne County, Oklahoma.

Regent Drilling Co., Vermilion, Alta., Canada, has started a wildcat test for its own account on a block in the Bruderheim area, about 13 miles southeast of Redwater field, northeast of Edmonton. The test, 1 Chief Redwater, is in LSD 8, 1-55-20w4.

Taggart Drilling Co., Mount Pleasant, Mich., has contracted to drill seven additional wells for Michigan Gas Storage Co. in Clare County, Michigan. Locations are Sections 4, 7, and 8-20n-5w.

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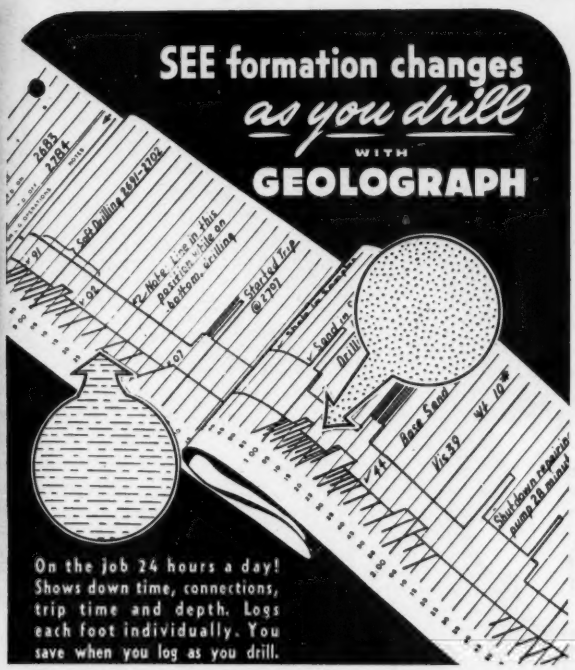
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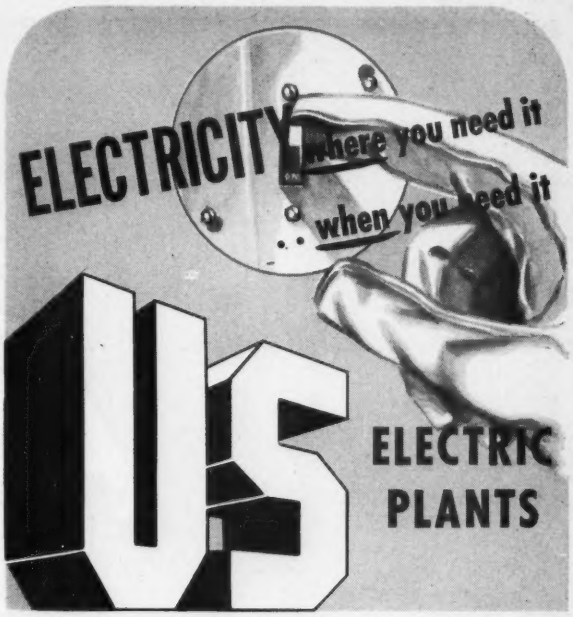

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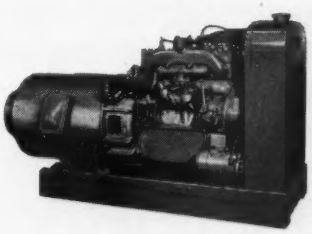

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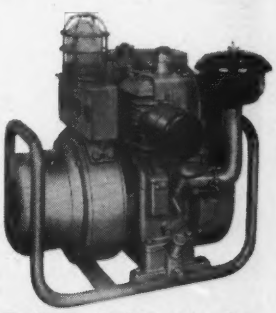

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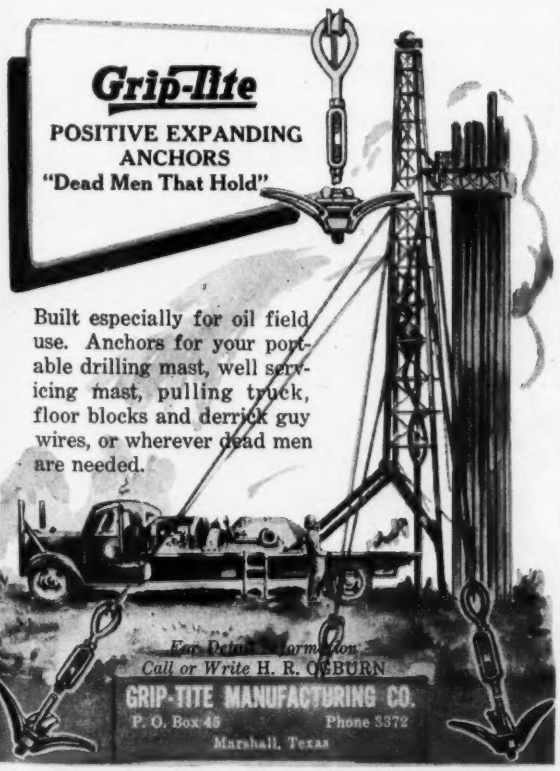
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Exploration and Drilling

Canada's Possibilities Now Look Enormous

CANADA'S oil discoveries of major size are coming so thick and fast that the reasonably optimistic forecasts of last summer now look like the observations of a confirmed pessimist. In the latest, and what may well be the biggest oil strike to date, Imperial Oil Co., Ltd.-Schoepp 1 Golden Spike, LSD 9, 22-51-27w4, only 4 miles west of the Woodbend north end area of Leduc, has still not found the water line in the Devonian pay at 5,927 ft., a mere 564 ft. below the top.

This well had the top of the reef at 5,363 ft., and has been coring and testing at intervals, until finally at 5,861-81 ft., after flowing gas and oil, when the pipe was pulled, it contained 60 ft. of salt water in addition to about 2,900 ft. of oil. But subsequent tests failed to get any water and another 46 ft. of pay has been found.

Golden Spike is definitely a new field, even though only 4 miles from the nearest Woodbend producers, because it has shown production far, far below the water line at Woodbend. Imperial has evidently known this all along, based on its seismograph data. It has already started two big stepouts; one nearly 3 miles northeast in LSD 3, 1-52-27w4, the other about 3½ miles northwest in LSD 3, 5-52-27w4.

These wide stepouts from the discovery well worked out well in the case of Redwater field. They indicate Imperial's confidence in its interpretation of the seismograph maps, and the stepout wells will probably give the company better data within the time limits in which it must select the amount of acreage the law allows it to retain.

Golden Spike looks much better, according to all authorities, than either Leduc or Redwater at a comparable stage of development. Leduc-Woodbend is rated as a 250-million-barrel field, and Redwater a 300-million-barrel field by T. A. Link, who is possibly Canada's outstanding geologist. ("Oil in Alberta and Western Canada," address to Toronto branch, Canadian Institute of Mining and Metallurgical Engineers, February 9, 1949). So, at this stage, Golden Spike must be tentatively classed as a potential 300-500-million-barrel discovery.

Big and important as the developments of the past year or two in Canada have been, they still represent the merest scratching of the surface of the area that looks potentially oil bearing to the exploration men. Link (see reference above) gives the Western Canada basin, where geological conditions look reasonable, a total area of 891,000 sq. miles. So many of the maps we are likely to see get distorted as they go north, that it might be better for us to think of this 891,000-sq. mile area in this way.

Take the eight leading states in oil production in the order of their production importance. They are Texas, California, Louisiana, Oklahoma, Kansas, Illinois, New Mexico, and Wyoming. The total area (not just the oil producing) of all of these states combined is 899,482 sq. miles, or just 1 per cent more than Western Canada's potential oil-bearing area. Last year these eight states averaged 5,150,000 bbl. daily production, or 92 per cent of the United States total.

From the area of the recent hot strikes in Devonian lime reefs to the Norman Wells (Canol Project field) far to the north, where the same formation yielded a 33-million-barrel field, is around 900 miles. (*See The Oil and Gas Journal, April 29, 1948, page 150).* Except for climatic conditions, it is something like, say 1905 in Oklahoma with Glenpool just discovered, and Spindletop going strong on the Texas Gulf Coast. Moreover, the pace is stepping up. In 1948, The Oil and Gas Journal indexed 22 articles on Western Canada. In the first 3 months of 1949 we have 12 indexed. The list is too long to include here, but references will be supplied if requested by mail.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

TEXAS PANHANDLE.—Sinclair Prairie released the following on its Roberts County wildcat, the 1 C. S. Lips: from perforations in the Mississippian at 8,900-70 ft., the well flowed 517 bbl. of 35°-gravity oil in 24 hours, cut 5 per cent with acid and wash water; 5-in. casing was cemented at total depth of 9,555 ft.

WEST TEXAS.—Placid Oil Co. 1 Odom, 6 miles north of Snyder in Scurry County, had prospects of flowing production from the Ellenburger. A 5-hour test from 7,713-33 ft. recovered 5,580 ft. of oil. Bottom-hole flowing pressure was 750 psi. When pipe was pulled, the 20th, 24th, and 25th stands unloaded oil. Stanolind completed its 2 J. F. Edwards as the Devonian discovery in the Landon (San Andres and Strawn) for 237 bbl. of oil daily.

NORTH LOUISIANA.—Hunt Oil Co. 1 S. W. Owens, NW SE 13-23n-7w, Claiborne Parish, opened the first Cotton Valley production in the East Haynesville field. Perforations at 8,580-8,600 ft. produced 276 bbl. of 62°-gravity oil a day. Tubing choke was ¼-in., flowing tubing pressure was 2,300 psi., and gas-oil ratio was 10,550 cu. ft.

MOCKY MOUNTAIN AREA.—The Western Natural Gas Co., Byrd-Frost et al second well at Dove Creek, Montezuma County, Colorado, is an apparent failure in the productive zone of the discovery well last year. The operator plans to deepen to the Paradox salt. Amerada recovered oil in a 2-mile northwest extension to the Melstone field, Musselshell County, Montana. A new discovery in the Newcastle is indicated with the recovery of oil on tests of Schlaijker Brothers' Hay Creek wildcat, Weston County, Wyoming.

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N. CENTRAL TEXAS

Canyon Sand Prospect For Fisher County

WICHITA FALLS.—Fisher County was in line for another discovery, 2½ miles west of the town of Royston. The new prospector is Woods Drilling Co. 1 Radford & Shell, which ran its first drill-stem test of the Canyon sand from 4,730-35 ft. With the tool open 1 hour, gas came to the top in 7 minutes and recovery was variously reported from 1,960 to 2,150 ft. of clean oil, plus some mud, and no water. Bottom-hole flowing pressure was 500 psi.; and 2,000 psi. shut in. Operators cored additional pay sand to 4,738 ft., and a second test, from 4,730-38 ft., showed gas in 8 minutes, and recovered 1,612 ft. of clean oil which unloaded when pipe was pulled.

Montague County.—R. J. Caraway and P. C. Bundy 1 J. Clingingsmith, J. Winn Survey, A-861, 4 miles northwest of Montague, had flowing oil on the second and third drill-stem tests of the Bend conglomerate, from an indicated 40 ft. of pay. Operators believed it to be on a separate structure from the Minor field, 1 mile to the east.

Top of the Caddo was placed at 6,078 ft., and first pay in the conglomerate was logged at 6,146-55 ft. A 1-hour test at that interval brought gas to the surface in 8 minutes, and recovered 6,000 ft. of clean oil in the pipe. Additional pay was drilled from 6,156-77 ft., followed by 3 ft. of shale. A second test from 6,156-77 ft. had flowing oil in 9 minutes, estimated at 100 bbl. an hour. Flowing pressure was 1,600 psi., and shut in pressure was 2,825 psi.

Third drill-stem test from 6,224-30 ft. showed gas in 5 minutes and flowed oil in 55 minutes. Rate of flow was not estimated. Flowing pressure was 800 psi., and bottom-hole pressure was 3,125 psi. Operators were drilling ahead on a 6,400-ft. or Barnett shale contract, and moving in storage tanks for testing.

The Texas Co. and Continental Oil Co. 1 Lizzie Barker, Block 1, Limestone CSL, 3½ miles southeast of Stoneburg, was taking a drill-stem test in conglomerate at 6,182-95 ft., which showed stain and odor in drilling. It is a west extension to the Queens Peak field.

Continental's 1 W. M. Fry, 6,500-ft. wildcat in the W. H. Chandler Survey, 4 miles south of Montague, was in shale at 4,313 ft. The same operator's 1 Williams, J. Belew Survey, ran tubing to 6,454 ft. and prepared to perforate in the conglomerate at 6,335-50 ft.

Moran Brothers 1 Richardson, Block 29, E. T. Survey, 1 mile east of the Kennedy Caddo field, 3½ miles south of Montague, topped the Caddo at 6,184 ft. and was drilling below 6,196 ft. One mile north of this test, Russell Maguire 1 Nord, Block 29, was drilling below 5,443 ft. Maguire 1 Hudspeth, S. A. Mills Survey and 1-mile east outpost to the Grunow Strawn field, was drilling below 6,077 ft.

Continental 1-A L. M. Staley, 67-4-H&TC-RR, 2 miles south of Ringgold, recovered 25 ft. of slightly oil-cut mud on a 2-hour drill-stem test at 5,794-5,819 ft. The section was not identified. A second test was to be run at 5,822-32 ft.

Jack County.—C. G. Glasscock and Pontiac Refining Co. 1 R. L. Morris, J. U. Fields Survey, 1 mile northwest of the Thrift field, was drilling in shale below 5,155 ft. Top of the conglomerate had not been reported.

Mid-Continent Petroleum Corp. 1 Campsey, Thompson Survey, about 1½ miles southeast of the 2 Killen, was rigging up rotary for a 6,000-ft. test.

Jack Grace Production Co. 1 Edger Brown, is a new 6,300-ft. test, 900 ft. from north and 150 ft. from east lines of the J. M. Hudson Survey, 10 miles north of Jacksboro.

Mid-Continent's 2 W. N. Killen, north offset to its Strawn sand discovery, B. Lewis Survey, 3 miles southwest of Post

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Oak, was drilling ahead in shale and lime at 5,715 ft. A 1-hour drill-stem test from 5,523-30 ft. showed gas in 2 minutes and recovered 6 ft. of oil-cut mud, with a small amount of free oil. Bottom-hole pressure was 2,275 psi. in 20 minutes. It drilled additional shows of oil in the conglomerate from 5,530-37 ft., and a 1-hour test of that interval showed gas in 12 minutes with a recovery of 30 ft. of gas-cut mud. Objective of the 2 Killen is the Ellenburger. Mid-Continent's 1 Killen was originally staked to the Ellenburger but found oil in the Strawn and completed in that section.

Wise County.—Mid-Continent 1 McBride, 3 miles south of Paradise, perforated casing in the Bend conglomerate from 5,456-90 ft., swabbed dry and acidized with 1,000 gal. When shut in overnight, pressure built up to 1,300 psi., and volume was estimated at 1,500,000 cu. ft. daily when reopened. There was some water. Operators squeezed and prepared to reperforate.

Big Bear Oil Co. 2 Hunt, C. F. McClain Survey, 1 mile north of the West Chico field, was swabbing after drilling plug to 5,818 ft. Recovery was not reported.

Throckmorton County.—Woodley Petroleum Co., Houston, completed its 1 G. H. Webb, Block 913, TE&L Survey, southeastern corner of the county ½ mile from the Stephens County line, for a daily potential of 715 bbl. of 41°-gravity oil. Gage was through 10/64-in. choke, from the Mississippian at 4,463-80 ft. Location is southeast of Mississippian production in the O'Dell field. Same operators staked location for their 1 H. R. Mixon, 612 ft. from north and 332 ft. from west lines, Block 913, ¼ mile north of the discovery. Woodley also staked location for its 1 Henry S. Bryson, 369 ft. from east and 1,008 ft. from north lines, Block 911, TE&L Survey, 3 miles southwest of Woodson. Contract is to 4,750 ft. to test the Mississippian.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) SUCCESSFUL WILDCATS

Archer County, ½ mi. S 1-C Fuller: Tom B. Medders 1 "A" Margaret Smith Hancock, 7-1-H&TC, 8 mi. S Wichita Falls, flowed 112 bbl. oil in 8 hr., 25/64-in. choke, potential 336 bbl., TP 40 psi., CP 50 psi., GOR 650 cu. ft., gravity 42°, sand pay 3,858-71 ft., TD

Eastland County, Puett area: Luling Oil & Gas Co. 1 J. G. Rumph, Sec. 25, D&DA Lands, 8 mi. SW Gorman, gas sand 2,564-90 ft., TD 2,898 ft., IP 6,000,000 cu. ft. gas a day, open 2-in., SIP 600 psi.

Palo Pinto County, Mingus area: W. K. Gordon 1 W. J. Langford, 59-3-T&P, 8 mi. NW Gordon, IP 2,500,000 cu. ft. gas a day, sand 3,654-58 ft., TD.

Shackelford County, Moran area: Honolulu Oil Co. 1 F. C. Pool, Blk. 35, University Lands, 1 mi. NW Moran, perforated 2,005-10 ft., IP 4,250,000 cu. ft. gas a day, open 2-in., TP 75 psi., CP 425 psi., SIP 555 psi., TD 5,276 ft., PB 2,091 ft., Hickory sand 5,190 ft., pre-Cambrian 5,273 ft., elev. 1,334 ft.

Stephens County: Bond Oil Co. and Prairie Oil & Gas Co. 1 J. B. Sloan, Sec. 1161, TE&L Sur., 1½ mi. N Crystal Falls, flowed 165 bbl. 43-gravity oil in 5 hr., 32/64-in. choke, CP 690 psi., TP 125 psi., GOR 575 cu. ft., TD 4,310 ft.

McElroy Ranch Co. 1 J. Barker, 3-8-T&P, 5 mi. W. Breckenridge, flowed 65 bbl. 44-gravity oil a day, 15/64-in. choke, Ellenburger 4,463-88 ft., TD, CP 200 psi., TP 60 psi., GOR 425 cu. ft.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) WILDCAT FAILURES

Archer County: G. E. Kadane & Sons 1 T. B. Wilson, 7-3-H&TC, 2 mi. SW Mankins, dry, TD 5,235 ft.

Kadane & Sons and Sunray Oil Co. 1 J. M. Boodworth, Blk. 8, George Bruner Sur., 1½ mi. W Scotland, dry, TD 4,674 ft., sand with oil show 4,658-72 ft.

Timberlake & Scott 1 G. T. Taylor, Blk. 136, J. W. Harris Subd., 1 mi. N Archer City, dry, TD 1,375 ft.

Coleman County: Hester & Hester 1 R. E. Harris, Sec. 23, HT&B Sur., 3 mi. S Burkett, dry, TD 2,296 ft., Caddo 2,261 ft.

O. W. Speer 1 F. H. Stanton, Stephens Lieul Sur., 5 mi. SE Rockwood, dry, TD 1,980 ft., Saddle Creek sand 820 ft.

Viking Oil Corp. 1 Leon Weaver, A. Gabel Sur., 9 mi. E Coleman, dry, TD 1,936 ft.

Cooke County: J. W. Baldwin 1 C. L. Links, H. Nail Sur., 2 mi. S Hood, dry, TD 1,303 ft.

Eastland County: R. W. Fair 1 Ed Duggan, Sec. 12, M. A. Clark Sur., 13 mi. S Cisco, dry, TD 3,305 ft., Caddo 2,601 ft., Marble Falls 3,152 ft.

Jones County: Robinson-Puckett, Inc., 1 Cullwell, Sec. 47, D&DA Lands, 5½ mi. NE Anson, dry, TD 4,344 ft., Saddle Creek 2,040 ft., Coal 2,090 ft., Flippen 2,105 ft., King sand 2,415 ft., Palo Pinto 3,910 ft.

Texas Pacific Coal & Oil Co. 1 J. Culbertson, Sec. 155, Blk. 1, 3 mi. NE Hamlin, dry, TD 3,468 ft., Noodle Creek 2,591 ft., Saddle Creek 2,813 ft., Flippen sand 2,880 ft., Cisco 3,253 ft., Swastika 3,321 ft., elevation 1,710 ft.

Wichita County: W. H. Hammon 2 Fassett & Tubble "B," Blk. 37, H&N Subd., Cherokee CSL, 3 mi. E Wichita Falls, dry, TD 4,518 ft.

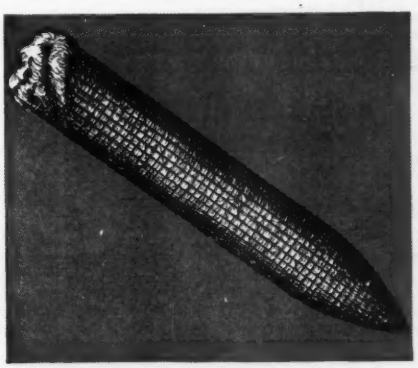
Young County: C. G. Butts 1 George Rice, I. Holman Sur., 7 mi. W Olney, dry, TD 1,296 ft.

Grace Production Co. 1 S. A. Morris, Sec. 254, TE&L Sur., 7 mi. SE Olney, dry, TD 4,095 ft., Caddo 4,058 ft.

MICHIGAN

South Beaverton May Get ½-Mile Extension

MOUNT PLEASANT.—Leonard Oil, Inc., 1 Gethek, NE NE SE 35-17n-2w, semi-outpost test to the South Beaverton Dundee oil field, Gladwin County, was being tested in that horizon at a temporary total depth



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of 3,872 ft. where a good showing of gas was reported logged and hole was said to be filling with oil.

The Leonard outpost logged Dundee objective at 3,800 ft. and first showing of oil and gas came in at 3,846 ft. with increases in both oil and gas showing from pay drilled between 3,855-62 ft. and 3,870-72 ft. Tanks were being moved to lease before further testing and possible deepening to approximately 3,890 ft. This semiwildcat is located about ½ mile south of the South Beaverton field which was discovered in 1936 and developed primarily by Sun Oil Co.

Another good Dundee flowing well was being tested in the Isabella field, Isabella County, at Merrill Drilling Co. 1 Taylor, NW NW NW 18-15n-4w, which was reported to be flowing at an initial rate of 10 bbl. of oil per hour through a 13/64-in. choke following acidization with 200 gal. Dundee objective was logged at 3,775 ft. and hole was bottomed out at 3,781 ft. Well flowed by heads natural at a rate of 44 bbl. per day. This is Merrill's fourth successful completion in the field. One dry hole was drilled immediately following the discovery producer, and this week the second dry Dundee test, located a full mile southeast of the discovery, was finished by Roosevelt Oil & Refining Corp.

MICHIGAN WILDCAT FAILURES

Allegan County, Hopkins Township: Basin Oil Co. 1 Moore, NE NW NE 35-3n-12w, Traverse 1,726 ft., dry, TD 1,743 ft.

Lee Township: Norman L. Stevens 2 Rivard, SW SW NW 31-1n-15w, Traverse 1,174 ft., dry, TD 1,422 ft.

Barry County, Prairieville Township: Gortsema & Meyer 1 Gilkey, SE NW SW 21-1n-10w, Traverse 1,838 ft., dry, TD 1,975 ft.

Clare County, Frost Township: Sun Oil Co. 1 Gronda et al, NE NW SE 36-20n-4w, Dundee 4,036 ft., dry, TD 4,173 ft.

Isabella County, Isabella Township: Roosevelt Oil & Refining Corp. 1 Lewis, NW NW SW 21-15n-4w, dry in Marshall, TD 1,705 ft.

Kalamazoo County, Comstock Township: Z. M. B. Oil Co. 1 Stewart, SE SE SE 10-2s-10w, Traverse 1,364 ft., dry, TD 1,392 ft.

Lake County, Webber Township: Merrill Drilling Co. 1 Kelly & Dobry, SW SW NW 24-18n-13w, Dundee 3,058 ft., dry, TD 3,252 ft.

Ogemaw County, Mills Township: J. O. Mutch 1, State-Mills, SW NE SW 3-21n-3e, Traverse 2,115 ft., dry, TD 2,150 ft.

Osceola County, Highland Township: Granville C. Berlin 1 Hundt, NE NE NW 29-20n-8w, Dundee 4,065 ft., dry, TD 4,217 ft.

Tuscola County, Akron Township: Basin Oil Co. 1 Elliott, SE SW SW 27-14n-8e, Dundee 2,685 ft., dry, TD 2,987 ft.

Van Buren County, Bangor Township: Harris Oil Co. and Del Fortney 1 Stepansky, SW SW NE 6-2s-16w, Traverse 1,007 ft., dry, TD 1,040 ft.

Pine Grove Township: Stuart L. Godfrey 1 Harbolt, SE SW NE 10-1s-13w, Traverse 1,443 ft., dry, TD 1,447 ft.

EASTERN TEXAS

Joaquin Field Gets SE Extension

DALLAS. — Paul Pewitt F-1 Pickering, H. A. Reed Survey, 6 miles southeast of Joaquin in eastern Shelby County, extended Pettit production 4,000 ft. southeast of the Joaquin field. The semiwildcat was not gaged, in testing the lower Pettit from 5,968-92 ft., after treatment with 3,000 gal. of acid, but registered 300 psi. flowing pressure through ½-in. choke. It was to be retreated in that zone.

The well also made a flowing test from the Hill zone from 4,908-16 ft., registering a flowing pressure of 1,200 psi., through ½-in. choke after a 2,000-gal. acid treatment. According to reports, it will be completed from both zones.

Meanwhile, Pewitt was moving in equipment for another semiwildcat 1¼ miles east and slightly north of the F-1 Pickering. The new test is to be the 1 Annie Irish, 467 ft. from north and west lines of a 106-acre tract in the Thomas Kilgore Survey.

First completion in 10 years for the Boggy Creek Woodbine sand field of northern Anderson County was reported as Garven Oil Co. 5 Roberts, D. Roberts Survey, which pumped 7½ bbl. of oil in 24 hours. Total depth was 3,565 ft.

Gulf Oil Corp. 1 John Veach, McFarland Survey, 4 miles southeast of Maud in Bowie County, topped the Smackover at 9,614 ft., in coring to 9,630 ft. Cores from 9,614-17 ft. had a sour gas odor. No other shows were reported.

Placid Oil Co. 1 Winston, William D. Perry Survey, in the Harrison County side of the Longwood field, logged good porosity and a distillate show in cores from 5,658-78 ft., and also in cores from 5,678-98 ft. A third core from 5,698-5,718 ft. had no shows. Operators were drilling ahead below 6,000 ft., toward projected depth of 8,500 ft. Location is a northwest offset to Phillips Petroleum Co.'s Cotton Valley discovery, across the line in Caddo Parish.

Humble 1 Crawford, Z. Bennett Survey, Nacogdoches County wildcat, 2 miles northwest of Trawick, was coring ahead below 7,785 ft. in lime and shale. The well has cored most of the way from 7,600 ft., revealing scattered shows of gas in the Pettit lime.

Sun Oil Co. 1 Dedman, 3 miles south of Sacul in the J. M. Musquez Survey, was drilling near 3,000 ft.

W. M. Coats and Danciger Oil & Refining Co. 1 Wickham, Benton Survey, 15 miles southwest of Corsicana in Navarro County, set 8⅝-in. pipe to 397 ft. and continued drilling. It is one of four wildcats to be drilled on farmouts from an 8,500-acre block held by Stanolind Oil & Gas Co.

Lone Star Producing Co. was said to

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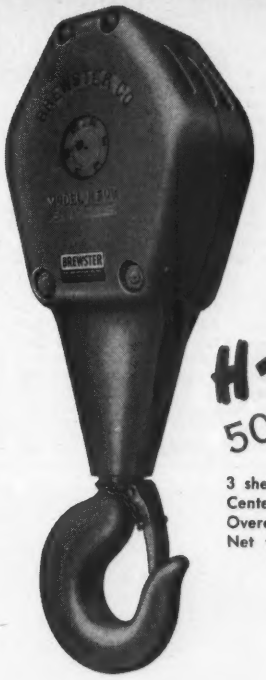
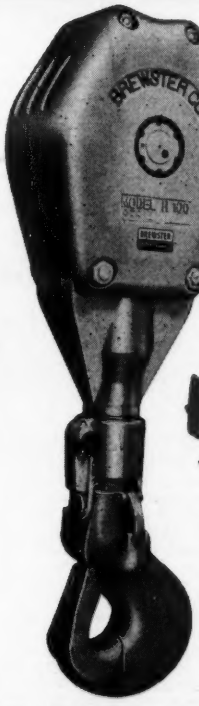


H-50
50 TONS

3 sheaves, 22" dia.
Center pin—3¼" dia.
Overall length—68¼"
Net weight—1,250



H-100
100 TONS

3 sheaves, 30" dia.
Center pin—5⅜" dia.
Overall length—95 13/16"
Net weight—3,400 lbs.

R-430
120 TONS
R-330 — 90 TONS

MODEL R-430
4 sheaves, 30" dia.
Center pin—5⅜" dia.
Overall length—54¼"
Net weight—2,600 lbs.

MODEL R-330
3 sheaves, 30" dia.
Center pin—5⅜" dia.
Overall length—53½"
Net weight—1,800 lbs.

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have temporarily delayed drilling its 1 Pinkston, proposed wildcat in the Jacksonville area of Cherokee County. According to report, materials were being moved in but the rig had been moved to another location in Hopkins County.

EAST TEXAS (DISTRICTS 5 & 6) WILDCAT FAILURES

Kaufman County: C. H. Murphy 1 Homer Burton, A. J. Payne Sur., 12 mi. SE Kaufman, dry, TD 5,310 ft., Paluxy 5,095 ft. by samples, elevation 405 ft.

Shelby County: Barnsdall Oil Co. 1 East Pickering Lumber Co., Wm. Crane Sur., 6½ mi. E Shelbyville, dry, TD 7,508 ft., Nacatoch 1,836 ft., Saratoga 1,894 ft., Annona 2,156-2,294 ft., Tokio 2,555 ft., Eagleford 3,248 ft., Fredericksburg 3,290 ft., Paluxy 3,533 ft., upper Glenrose 4,626 ft., Massive anhydrite 5,287-5,510 ft., Bacon lime 5,522-5,559 ft., James 6,054 ft., Sligo 6,372 ft., Pettit 6,609 ft., Travis Peak 7,252 ft., elevation 318 ft.

SOUTHWEST TEXAS

Condensate Discovery in Nueces County Completed

CORPUS CHRISTI.—Shell Oil Co. 1 W. M. Bevly, new gas-condensate discovery, from the 9,900-ft. level, 3 miles south of Clarkwood, Nueces County, has been gaged at 140 bbl. of 53°-gravity condensate per day plus 2,860,000 cu. ft. of gas per day through a ¼-in. choke, tubing pressure 2,330 psi., shut-in pressure 4,064 psi. This production is from open hole at 9,914-48 ft. Total depth is 11,004 ft., with 7-in. casing set to 9,914 ft. This well is located in the Wm. J. Cody Survey.

The Texas Co. 1 Canobio Cantu, Jr., wildcat, 2½ miles west of the Cadena field, in Duval County, on drill-stem test at 4,675-78 ft., open 12 minutes, using ¼-in. chokes, developed 400 psi. working pressure and flowed dry gas, bottom-hole pressures 1,000 psi. open and 1,800 psi. shut in. On drill-stem test at 4,678-85 ft., developed 370 psi. working pressure and flowed dry gas with slight show of salt water. Another test, being from 4,718-28 ft., recovered salt water, also. Operators are drilling ahead below 4,905 ft. This test is in Benito Ramos Survey A-478, 9 miles west of San Diego.

A new, deeper oil pay zone for the Copano Bay field of Aransas County, has been opened by Phillips Petroleum Co. 1 "Aransas" (State Tract 35) well. Completion was made through perforations at 7,685-90 ft., and showed good for production of 165 bbl. of oil per day through an 11/64-in. choke, with 1,450 psi. tubing pressure, casing sealed. Gas-oil ratio 4,220, and gravity of the oil 43.6°. Top of pay sand was 7,682 ft. and total depth 7,772 ft. This is a directional well drilled from the same platform as the 1 "Copano" (State Tract 34) discovery oil well in Copano Bay, 3 miles north of the Fulton Beach field and 9 miles north-northeast of Rockport. The discovery well was completed through perforations at 7,143-48 ft., flowing 168 bbl.

In the Cecil field, Hidalgo County, Clark Fuel Producing Co. 2 Bemis Daskam has been completed in a new, shallower pay zone. Casing was perforated at 4,260-63 ft. for the completion, but no gage has been reported as yet. The well now is shut in for storage. Total depth is 4,271 ft., with 5½-in. casing set on bottom. This well is located in Lot 27, Porcion 45.

There were 23 new locations reported for Districts 1 and 4, with 7 being wildcat starts, 2 each in Guadalupe and Webb, and 1 each in Bexar, Duval, and Starr counties. Two successful exploratory tests were completed, one each in Brooks and San Patricio counties. The 12 wildcat failures were: 3 in Duval, 2 each in Jim Hogg, Nueces, and Starr, and 1 each in Bexar, LaSalle and Webb counties.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) SUCCESSFUL WILDCATS

Brooks County: New gas-condensate pool—Amerada Pet. Corp. 1 Concepcion Garza Zamora, in Block 5-H, Share 4, H. Brooks Subd., in Loma Blanca Grant, A-98, 3 mi. NE of Falfurrias, TD 8,610 ft., perf. 7,345-56 ft., IP: 6,400,000 cu. ft. gas per day on open flow, ratio 28,000, flowed 1,240,000 cu. ft. gas per day through ¼-in. choke, with 44 bbl. condensate per day, shut-in pressure 2,580 psi., gravity 52.7°.

San Patricio County: New gas pay, North Mathis pool—Fred M. Manning, Inc., 1 J. V. Nelson et al, in W. R. Ray Sur. 4, A-337, TD 4,860 ft., perf. 2,788-98 ft., IP: 1,520,000 cu. ft. gas per day on open flow (dry gas), shut-in pressure 1,150 psi.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) WILDCAT FAILURES

Bexar County: Baker Oil Co. 1 E. M. Baker-Fee, in Francisco Rolen Lge. and Labor Sur. 48, A-617, dry, TD 1,200 ft. Top Taylor 1,040 ft., top Anacacho 1,140 ft.

Duval County: Cam Drilling Co. & Transwestern Royalty Co. 1 A. G. Beall Black (Canales Fee), in Pedro de la Zerda Sur. 7, dry, TD 4,519 ft.

Frank J. Gravis et al 1 Leroy Denman, Lot 1, Block 82, Addn. 5, Realitos Subd. of Copita Farm & Garden Tracts, 10 mi. S of Benavides, dry, TD 5,305 ft.

Taylor Refg. Co. R-2 Parr, in J. Poitevent Sur. 279, ½ mi. NE of Agua Prieta field, dry, TD 4,860 ft.

Jim Hogg County: Amerada Pet. Corp. 2 Tomasa M. de Garcia, in AB&M Sur. 93, 10 mi. SW of Hebbronville, dry, TD 3,506 ft.

Smith-Story-Wood Corp. & W. E. Fox Tr. 1 C. W. Hellen, Sur. 150, 6 mi. NW of Hebbronville, dry, TD 3,122 ft.

LaSalle County: Newman Bros., Alaska Steamship Co. & H. L. Rymal 1 Nueces Land & Livestock Co., in H&GN Sur. 20, 4 mi. SE of Quinnsache field, dry, TD 4,085 ft.

Nueces County: C. Andrade III 1 Lela Frances Allen Doughty et vir, in Lot 1,

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Laureles Farm Tr., 1 mi. S of London, dry, TD 7,620 ft.

Comanche Corp. 1 R. H. Dennis, Lot 13, Block 4, Nueces River Irrig. Park Subd., 1¾ mi. N-NE of Robstown, dry, TD 7,510 ft.

Starr County: Continental Oil Co. Q-1 M. M. Garcia, in Sur. 918, 25 mi. NE of Rio Grande City, dry, TD 5,505 ft.

W. H. Holland 1 La Brisa Land & Cattle Co., in Tr. 213, Porcion 90, 12 mi. NE of Rio Grande City, dry, TD 4,365 ft.

Webb County: Amerada Pet. Co. 1 Benavides, in Santo Tomas Grant, A-57, Sur. 1450, 20 mi. N of Laredo, dry, TD 11,679 ft.

TEXAS GULF COAST

Wharton County Gets New Pool Near Kubela

HOUSTON.—A new oil-producing area south of Kubela production in Wharton County has been opened by The Texas Co. 1 Selma Kainer, located in the I&GN Survey, Section 25, Abstract 423. Drilled to a total depth of 4,725 ft., with 5½-in. casing cemented to 4,685 ft., the well was completed through a 20/64-in. choke flowing 53 bbl. of fluid per day, 40 bbl. of which was 24°-gravity oil. Flowing pressure on tubing was 60 psi.

A new gas field in the Hildebrandt Bayou area of Jefferson County has been opened by H. B. Hebert, C. B. Claypool, and J. C. Means, Jr., 1 H. Burrell Heirs, in Bennett Blackman Survey, 2½ miles southeasterly from Fannett production. Total depth is 8,761 ft. Through perforations at 8,453-8,458 ft., the well flowed gas with a spray of condensate through a ⅛-in. choke with flowing pressure on tubing at 2,200 psi. Well is shut in awaiting storage.

Sun Oil Co. A-1 Middleton, a new gas-condensate discovery if the North Oyster Bayou field, Chambers County, has completed a potential flow gage. On a ¼-in. choke the well flowed at the rate of 1,707,000 cu. ft. of gas daily and 23.80 bbl. of 48.1°-gravity condensate daily with flowing pressure on the tubing at 3,240 psi. Gas-condensate ratio 71,840. Estimated open flow is 26,000,000 cu. ft. of gas per day. Shut-in pressure on the tubing is 3,375 psi. Total depth is 9,707 ft., with perforations at 9,207-10 ft. for the completion.

A new oil pay has been opened on the southwest flank of the Big Creek dome in Fort Bend County by The Texas Co. 1 Perryman S. Moore et al, located in the Barnabus Wickson Survey. Sand was topped at 3,540 ft., and through perforations at 3,540-3,546 ft., the well flowed 49.46 bbl. of 29°-gravity oil per day through a ¼-in. choke, flowing pressure on tubing ranging from zero to 60 psi. Total depth is 4,322 ft.

Butcher-Arthur, Inc., 1 John A. Jones, in James Rankin, Jr., Survey, opened a new gas field southwest of the Cold Springs field in San Jacinto County. The well flowed at the rate of 2,171,000 cu. ft. of gas per day through a 3/16-in. choke, with 1,500 psi. Open flow calculation was 6,200,000 cu. ft. daily. Total depth is 8,364 ft., with perforations from 4,492-4,496 ft. for the completion.

The 39 new locations for Districts 2 and 3 included 8 wildcat starts, one each in Calhoun, DeWitt, Goliad, Hardin, Harris, Liberty, Orange and Victoria counties. Five successful wildcats were completed, one each in Austin, Fort Bend, Liberty, San Jacinto and Victoria counties, while five were dry, one each in Bee, Calhoun, DeWitt, Lavaca and Victoria counties.

TEXAS GULF COAST (DISTRICTS 2 & 3) SUCCESSFUL WILDCATS

Austin County: New gas-condensate discovery—Gulf 1 Adolph Weige, in James Tylee Sur., A-304, in New Ulm area, TD 11,071 ft., top sand 9,668 ft., perf. 9,668-90 ft., IP: 127 bbl. condensate per day and shut in, no gage.

Fort Bend County: New oil sand, Big Creek field—Texas Co. 1 Perryman S. Moore

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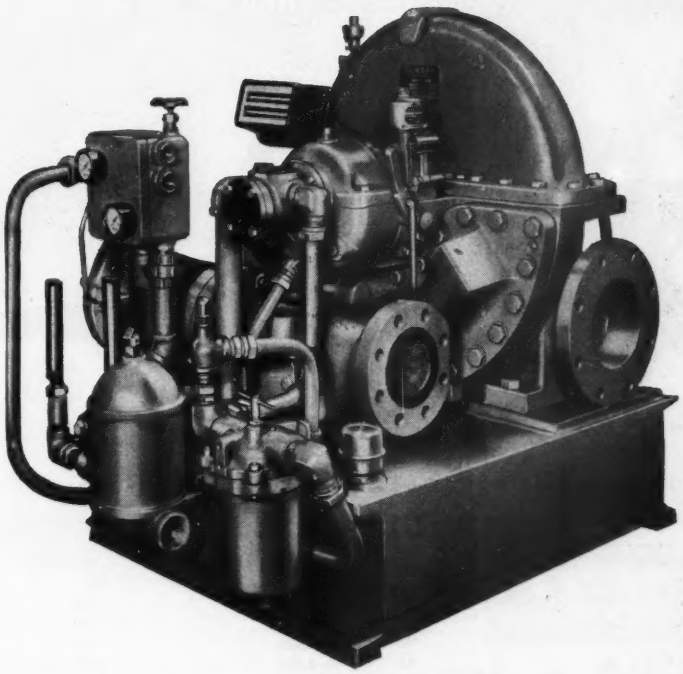

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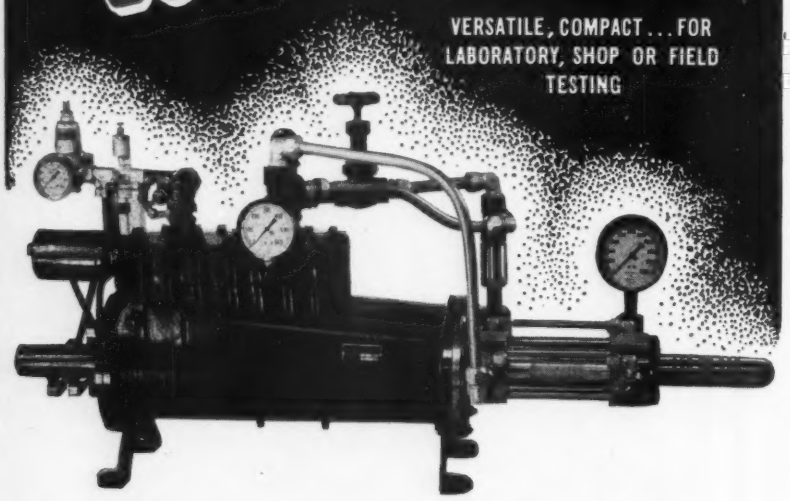

OPERATING DATA 6" UNIT — based upon inlet powering pressure of 100 P.S.I.

UNIT	Pressure Ratio	Discharge Pressure	Volume Output In Primary	Volume Output In Secondary
6-5¼ with 1¾" Pressure Booster	10	0- 1,000	14 GPM	4.75 GPM
6-5¼ " 1½" " "	15	0- 1,500	"	3.4 "
6-5¼ " 1¼" " "	20	0- 2,000	"	2.23 "
6-5¼ " 1⅛" " "	30	0- 3,000	"	1.72 "
6-5¼ " 1" " "	40	0- 4,000	"	1.27 "
6-5¼ " ⅞" " "	60	0- 6,000	"	0.87 "
6-5¼ " ¾" " "	100	0-10,000	"	0.53 "

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et al, in Barnabus Wickson Sur., TD 4,322 ft., top sand 3,540 ft., perf. 3,540-46 ft., IP: 49 bbl. oil per day through ¼-in. choke, GOR 575, TP 0-60 psi., gravity 29°.

Liberty County: New oil sand, Hull field—Houston Prodn. Co. B-2 Alpha A. Heimple, in T. Trahan Sur., TD 8,027 ft., top sand 7,187 ft., perf. 7,187-7,204 ft., IP: 499 bbl. oil per day through ⅛-in. choke, GOR 373, TP 1,750 psi., CP 1,800 psi., gravity 31.2°.

San Jacinto County: New gas-condensate discovery—Butcher-Arthur, Inc., 1 John A. Jones, in James Rankin, Jr., Sur. A-40, TD 8,364 ft., top sand 4,492 ft., perf. 4,492-96 ft., IP: 2,171,000 cu. ft. gas per day through 3/16-in. choke, open flow 6,200,000 cu. ft. gas, TP 1,500 psi.

Victoria County: New oil pay, Coletto Creek field—Fidelity Oil & Royalty Co. 3 William Dietzel, in H. Manchola Sur., top pay 4,305 ft. in Frio Zone, TD 4,912 ft., perf. 4,332-37 ft., IP: 145 bbl. oil per day through a ⅛-in. choke, GOR 450, TP 525 psi., CP 900 psi., gravity 24.3°.

TEXAS GULF COAST (DISTRICTS 2 & 3)
WILDCAT FAILURES

Bee County: H. R. Smith & Seaboard Oil Co. of Dela. 1 O. W. McGregor, in I. J. Miller Subd., 5 mi. NW of Skidmore, dry, TD 4,314 ft.

Calhoun County: The Texas Co. 1 F. S. Haines, in Samuel Houston Sur., 3.7 mi. N-NE of Olivia, dry, TD 8,850 ft.

DeWitt County: Humble 1 Mrs. Hilda Schmidt Dagg, in Nicholas Peck Lge., 6 mi. SE of Terryville, dry, TD 7,876 ft.

Lavaca County: The Texas Co. 1 John Bujnoch, in Matthew Caldwell Lge., 1 mi. E of Word field, dry, TD 8,000 ft.

Victoria County: Progress Petroleum Co. of Texas 1 Eliese A. Sievers, in J. M. Hernandez Gr., 8 mi. W of Victoria, dry, TD 4,448 ft.

APPALACHIAN FIELD

Elk District Gets Good Oriskany Well

PITTSBURGH.—In Elk district, Kanawha County, West Virginia, United Fuel Gas Co. No. 19-6483 Chloe J. Copenhaver, elevation 737 ft., gaged 25,000,000 cu. ft. of gas with a rock pressure in 48 hours of 1,675 psi., Oriskany sand 5,145 ft., gas 5,156-5,175 ft., total depth 5,175 ft. This well is located on the Clendennin Quadrangle on the waters of Mile Fork of Blue Creek, 4.05 miles south of latitude 38 degrees, 30 minutes, and 1.75 miles west of longitude 81 degrees, 25 minutes. In Ripley district, Jackson County, South Penn Oil Co. No. 1 N. S. King, elevation 768 ft., was shot in the Newberg sand with unfavorable results and will be abandoned. This well was drilled through the Clinton sand which was dry. In Union district, Wayne County, Owens, Libbey-Owens No. 1-663 Bowen & Smith, elevation 570 ft., was deepened through the Clinton and Medina sands and was dry. A good gas well in the shallow sands was reported by United Producing Co. No. 75-1564 W. M. Ritter Lumber Co., 3,181,000 cu. ft., Berea sand, total depth 3,660 ft. A wildcat location in the Waterbury field has been made by Columbian Carbon Co. No. 1 C. W. Moore et al, elevation 771 ft. It is located on the Belleville Quadrangle, on the waters of Pond Creek, 2.10 miles south of latitude 39 degrees, .05 minutes, and 4.25 miles west of longitude 81 degrees, 30 minutes.

New locations reported in West Virginia were nine (9): Poca district, Putnam County; Clear Fork district, Raleigh County; Spencer district, Roane County; Buckhannon, Warren and Washington districts, Upshur County; and Steele district, Wood County.

In Amwell Township, Washington County, Pennsylvania, Carnegie Natural Gas Co. completed a good gas well in deepening operations in No. 682 Addison R. Hupp. It

tested over 2,700,000 cu. ft., Gantz sand 2,530 ft., gas 2,539-2,542 ft. Total depth 2,547 ft. In Napier Township, Bedford County, South Penn Oil et al-Snee & Eberly have overcome their fishing job in No. 1 Jesse B. Miller and are now drilling at 3,160 ft.

New locations reported in Pennsylvania were seven (7): Conemaugh Township, Indiana County; Amwell and Nottingham townships, Washington County; and Allegheny Township, Westmoreland County.

WEST VIRGINIA WILDCAT FAILURES

Jackson County, Ripley district: South Penn Oil Co. 1 N. S. King, elev. 768 ft., dry, Oriskany sand 4,720-4,750 ft., show of gas 4,736-4,739 ft., Newberg sand 5,423-5,432 ft., Clinton sand 6,099-6,177 ft., TD 6,283 ft.

Wayne County, Union district: Owens, Libbey-Owens 1-663 Bowen & Smith, elev. 570 ft. (deepened from 3,981 ft.), dry, Clinton sand 4,300-4,349 ft. Red Medina 4,432-4,654 ft., Gray Medina 4,654-4,687 ft., TD 4,745 ft.

SOUTH LOUISIANA

New Condensate Pool In Vermilion Parish

NEW ORLEANS.—A new gas-condensate pool in the central portion of Vermilion Parish has been opened by Hassie Hunt Trustee Estate 1 J. S. Broussard, 6-14s-1e, located 10 miles northerly from the East White Lake field. It was drilled to a total depth of 13,636 ft., with 7-in. casing cemented to 11,610 ft., and a liner from this point to total depth. The liner was perforated from 12,098-12,106 ft., and on initial test the well flowed at the rate of 70 bbl. of 43°-gravity condensate along with 1,667,000 cu. ft. of gas per day. The flow was through a 9/64-in. choke, flowing pressure on tubing being 2,980 psi. with gas-condensate ratio at 23,000.

Cecil Hagen 1 A. E. White, wildcat, located in Section 14-13s-3w, approximately 5½ miles east of Grand Lake production, in the Mallard Bay area of Cameron Parish, encountered sands showing oil at 9,700 ft., 10,100 ft. and 10,300 ft. Casing is being run to the bottom of the hole, which is 10,400 ft. and operators will test these zones. Two other sands were picked that had light shows, which were at 6,740 ft., and 9,100 ft. This test is off the east shore line of Mallard Bay area of Grand Lake.

Shell Oil Co., Inc., has completed another oil well on the Weeks Island of Iberia Parish below 14,000 ft. The 4 Smith-State Unit B, located in Section 18-14s-6e, was drilled to a total depth of 14,900 ft. and on initial test, through perforations at 14,015-14,025 ft., the well flowed 410 bbl. of clean pipeline oil per day through a 10/64-in. choke with flowing pressure on tubing at 2,600 psi. Operators are still testing.

Eight wildcat starts were included in the 24 locations reported for South Louisiana this week, 2 in Cameron, and 1 each in Acadia, Assumption, Calcasieu, Jefferson, Plaquemines and St. Mary parishes. Three successful exploratory tests were completed, one each in Jefferson, Pointe Coupee, and Vermilion parishes, while three wildcats were dry, one each in Beauregard, Lafourche and St. Mary parishes.

SOUTH LOUISIANA SUCCESSFUL WILDCATS

Jefferson Parish: New oil discovery, Manila Village—Tide Water Associated Oil Co. 1 State Lease 1299, in Sec. 25-18s-24e, 7 mi. S of Lafitte production, TD 13,050 ft., top sand 12,980 ft., perf. 12,944-13,050 ft. open hole, IP: 157 bbl. oil per day through 6/64-in. choke, GOR 5,500, TP 7,900 psi., 39°-gravity.

Pointe Coupee Parish: New oil sand, Fordoche field—The Texas Co. 2 Cleland W. Dearing et al, 20-6s-8e, TD 9,037 ft., top sand 8,607 ft., perf. 8,607-14 ft., IP: 206 bbl. oil per day through 10/64-in. choke, GOR 813, TP 1,225, 39.9°-gravity.

Vermilion Parish: New gas-condensate discovery—Hassie Hunt, Tr., 1 P. S. Broussard, 6-14s-1e, approx. 3 mi. S of Stanolind's 1 Watkins discovery well, TD 12,636 ft., top sand 12,098 ft., perf. 12,098-106 ft., IP: 70 bbl. condensate per day and 1,667,000 cu. ft. gas per day through 9/64-in. choke, GOR 23,000, TP 2,980 psi., 43° gravity.

SOUTH LOUISIANA WILDCAT FAILURES

Beauregard Parish: Atlantic Refg. Co. 1 Lutcher-Moore Lbr. Co., Tr., 3-5s-12w, 2 mi. NE of West Bevins production, dry, TD 7,503 ft.

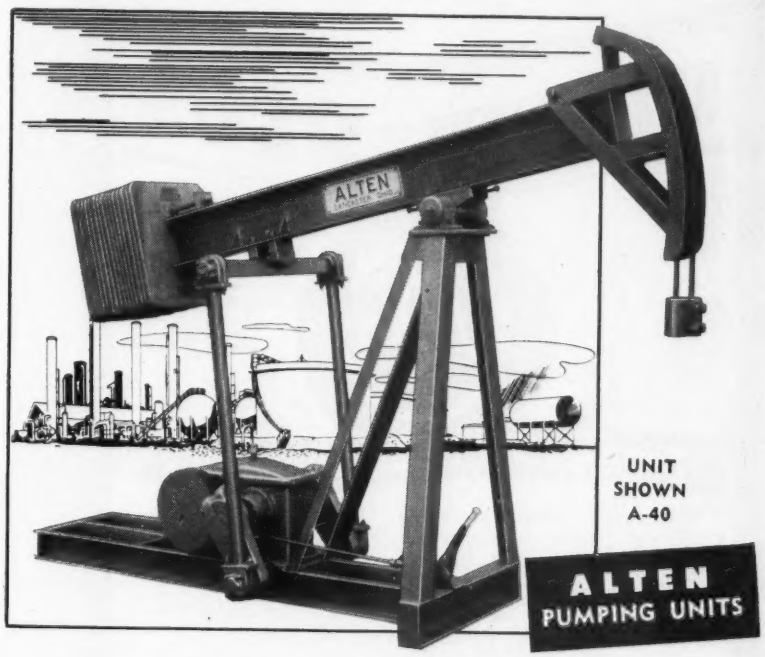
Lafourche Parish: H. L. Hunt 1 Grandison, in Coffee Bay area, 10-19s-23e, dry, TD 3,054 ft.

St. Mary Parish: Humble Oil & Refg. Co. 1 Lake Palourde-St. Lse. 1603, in Lake Palourde State Lease 1603, NE of Morgan City, dry, TD 14,319 ft.

KANSAS

Rice County Wildcat Tests Good Showings in Lansing

ANDERSON-PRICHARD OIL CORP. has what appears to be another new pool opener in northwestern Rice County. Its 1 Ringwald, NE SE NE 32-18-16, in a 30-minute drill-stem test at 2,934-44 ft. in the Lansing, topped at 2,856 ft. (—1,108 ft.) recovered 50 ft. of clean oil. Gas showed in 30 seconds after the tool was opened and flowed at the rate of 1,020,000 cu. ft. per day. Good saturation also was shown previously in the Topeka at 2,674-81 ft. Hole is being deepened to the Arbuckle. The well is 1½ miles south of the North Orth pool and about 2 miles southwest of the Orth



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pool. Levels checked about the same as in those pools.

Bay Petroleum Corp. 1 Krone, SW SW SW 30-20-12, southeastern Barton County, had good saturation in the Arbuckle at 3,491-96 ft. and has run 5½-in. casing to the top of this formation at 3,490 ft. A drill-stem test was made of the zone but in this only 7 ft. of oily mud was recovered. The location is a mile northeast of the Rolling Green pool and 2½ miles south of the recently opened Sun Valley pool.

Testing also is under way at two wildcats in southwestern Rooks County. Francis Oil & Gas Co. 1 Wilson, NE NE NE 2-10-20, 2 miles southeast of the Northampton pool, had good shows and saturation both in the Lansing and Arbuckle. Lansing was topped at 3,508 ft. (—1,269 ft.), with shows at 3,574-77 ft. and 3,588-96 ft. Arbuckle was topped at 3,823 ft. (—1,584 ft.). Lion Oil Co. 1 Mongean, NW NW NW 21-9-19, 1¼ miles south of the McCellan pool, also had good shows both in the Lansing and Arbuckle. Lansing was topped at 3,325 ft. (—1,204 ft.), and the Arbuckle at 3,631 ft. (—1,510 ft.). Total depth is 3,660 ft. with 5-in. casing on bottom.

Atlantic Refining Co. 3 McCandless, NE SE SE 30-25-13, a half mile east of the McCandless pool, southern Stafford County, has been given a bottom hole bomb potential rating of 1,342 bbl. per day. Production is from the Simpson sand through casing perforations at 4,248-60 ft. Top of the sand is 4,241 ft. (—2,281 ft.). Hole was drilled to 4,308 ft. in the Arbuckle.

J. P. Gaty 1 DeMoss, NW SW SW 7-26-3e, discovery well of the Butwick pool, western Butler County, has been given a drawdown potential rating of 3,000 bbl. per day following completion in the Mississippian, topped at 2,815 ft. (—1,467 ft.) Total depth is 2,865 ft., with casing at 2,856 ft.

The Paradise Creek pool in Rooks County has another maximum well in Cities Service Oil Co. 2-B Hilgers, CNL SE NE 21-9-18. It has been given a potential rating of 3,000 bbl. of oil per day from the Arbuckle at 3,577-79 ft. It is pumping through 5½-in. casing.

C. U. Bay 1 Burhle, SE SE NW 4-26-41, deep wildcat test in Hamilton County, has been abandoned. It was drilled to a total depth of 6,422 ft. in the Arbuckle, topped at 6,230 ft. (—2,899 ft.) Location is 15 miles west of the Hugoton gas field. It had the Topeka at 3,402 ft.; Lansing, 3,843 ft., Mississippian, 5,350 ft.; Misener, 6,120 ft., and Viola, 6,160 ft.

KANSAS SUCCESSFUL WILDCAT

Barton County: Aladdin Petroleum Corp. 1 Brodie, NW SW SE 23-19s-12w, IP 511 bbl. of oil per day from Arbuckle at 3,344-62 ft., TD.

KANSAS WILDCAT FAILURES

Hamilton County: C. U. Bay 1 Buhrle "C," SE SE NW 4-26s-41w, dry, TD 6,422 ft., Herrington 2,498 ft., Winfield 2,566 ft., Towanda 2,588 ft., Ft. Riley 2,620 ft., Wreford 2,720 ft., Topeka 3,402 ft., lime 3,843 ft., Mississippian 5,350 ft., Misener 6,121 ft., Viola 6,131 ft., Arbuckle 6,229 ft.

Fawnee County: Vickers and Gulf 1 Frizell, SW SW NW 4-22s-17w, dry, TD 4,040 ft.

Pratt County: Lion Oil Co. 1 Newby, SE NE SW 11-26s-15w, dry, TD 4,610 ft., lime 3,846 ft., conglomerate 4,171 ft., Kinderhook 4,288 ft., Viola 4,345 ft., Simpson 4,516 ft., Arbuckle 4,471 ft.

Rooks County: Harry Gore 1 Nichol, SW SE SW 5-6s-20w, dry, TD 3,646 ft., Topeka 3,123 ft., Heebner 3,324 ft., Dodge 3,344 ft., Reagan 3,606 ft., granite wash 3,607 ft., solid granite 3,644 ft.

Russell County: Nadel & Gussman 1 Davis, NE NE NE 26-12s-15w, dry, TD 3,308 ft., Lansing 2,994 ft., Arbuckle 3,283 ft.

Jones & Shelburne et al 1 Gorham, NW NW NW 21-13s-15w, dry, TD 3,297 ft., anhydrite 880 ft., Topeka 2,731 ft., Heebner 2,954 ft., Lansing 2,999 ft., Arbuckle 3,264 ft.

Rine Drilling Co. 1 Fred Schmidt, NE NE NE 32-13s-13w, dry, TD 3,408 ft., anhydrite 815 ft., Topeka 2,953 ft., Lansing 3,018 ft., conglomerate 3,328 ft., Arbuckle 3,350 ft.

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MISSISSIPPI

LaGrange Field Gets ½-Mile North Extension

JACKSON. — The LaGrange field, Adams County, was extended approximately ½ mile north with the completion of Humble Oil & Refining Co. 1 Bessie Moore, 66-7n-2w. On initial production test the well flowed 111 bbl. of 38.4°-gravity oil through a ½-in. choke, tubing pressure 420 psi. and casing pressure 520 psi. Production is through perforations at 6,070-80 ft. in Baker (Wilcox) sand.

Gulf Refining Co. 19 Andrews, 6-1n-16w, in Baxterville field, Lamar County, has been completed for an initial production of 50 bbl. of 15.3°-gravity oil per day through a ¼-in. choke. Tubing pressure 150 psi. Total depth is 8,897 ft. Production is through 294 perforations in interval from 8,694 ft. to 8,826 ft.

In Pine Ridge field, Adams County, Phillips Petroleum Co. 1 Pearline, 36-8n-2w, was completed for an initial production of 107 bbl. of 41°-gravity oil per day through a 13/64-in. choke. Production is through perforations at 5,604-14 ft.

Humble 1 Alice West-Masonite Corp. et al, 13-9n-8w, in Yellow Creek field, Wayne County, was completed for an initial production of 178 bbl. of 19.8°-gravity oil per

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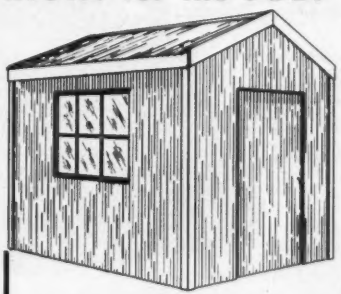

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day, on pump. Total depth is 5,116 ft., and perforations at 5,082-5,104 ft.

Two wildcat starts were reported, both in Hinds County. Eight development locations were made, 3 in Yellow Creek, 2 in LaGrange, and 1 each in Bude, LaGrange-South, and Mallalieu fields. One wildcat failure was completed in Lamar County.

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Weston County, after failing to find production through the Morrison.

WILDCAT SUCCESS IN WYOMING

Riverton, Fremont County: Atlantic Refining Co. 1 Tribal, SW SE 25-1s-4e, 11,884 ft. TD, flowed 485 bbl. oil per day through ¾-in. choke, 48.2° gravity, Cody 4,350, Frontier 7,950, Muddy 9,238, Dakota 9,385, Morrison 9,486, Gas sand 9,525 Sundance 9,773, Nugget 10,095, Chugwater 10,346, Dinwoody 11,315, Phosphoria 11,370, Tensleep 11,665 ft.

WILDCAT FAILURE IN WYOMING

Morrisey area, Weston County: W. E. Atkinson 1 Government "A," SW SW SW 15-41n-63w, 5,520 ft. TD, abnd., no Newcastle sand, Dakota 5,354, Fuson 5,447, Lakota 5,465, Morrison 5,473 ft.

WILDCAT FAILURE IN UTAH

Bitter Creek, Uinta County: Seaboard Oil Co. 1 Unit, NW SW NW 10-10s-22e, 8,520 ft. TD, abnd.

OKLAHOMA

Rich Valley Field Gets Second and Third Wells

THE second well for the new Rich Valley field in Grant County has been completed, and a third is in process of completion. Carter Oil Co. 1 Moore-Daniel, SW SE SE 36-26n-5w, northwest offset to the discovery well, flowed 285 bbl. of 47.5° clean oil in 5 hours on production gage through ¾-in. choke. Production is from two zones of the Wilcox. The lower zone, the Marshall sand, is flowing from open hole at 5,833-44 ft. The upper zone is the Simpson dolomite, in which casing was perforated at 5,780-5,806 ft. The latter was acidized with 2,000 gal. Gas-oil ratio on the production test was 1,070 cu. ft. per barrel.

Sinclair Prairie Oil Co. 1 Ruzek, SW SW SW 31-26n-4w, northeast offset to the discovery well, also is expected to make a good well. On a 60-minute drill-stem test at 5,842-52 ft. in the Marshall zone (second Wilcox), it flowed at an estimated rate of 25 bbl. of oil per hour and 250,000 cu. ft. of gas per day. Gas showed in 3 minutes and oil started flowing in 54 minutes after the tool was opened. After running electric log, 7-in. casing was cemented at 5,850 ft., 2 ft. off bottom. At latest report, plug was being drilled preparatory to perforating casing.

The Sinclair well also had showings in the Simpson dolomite although a drill-stem test in this was not too favorable. The latter zone was tested at 5,799-5,819 ft. with the testing tool open 65 minutes. Gas showed in 11 minutes and flowed at an estimated rate of 30,000 cu. ft. daily. When tool was pulled, 325 ft. of 46.4° distillate and 25 ft. of gas and distillate-cut mud was recovered.

The field was discovered by Mid-Continent Petroleum Corp. and Viersen-Cochran 1 Vollmer, NE cor. 1-25n-5w, which flowed 705 bbl. in 14 hours through ½-in. choke on initial production test. Its pay is the Marshall zone with flow from open hole at 5,829-48 ft. Two dry holes, one to the south and the other southeast of the discovery well, leave the two new wells to establish the production trend to the north.

Two new operations already have been started, one by Mid-Continent Petroleum Corp. and Viersen-Cochran at their 1 Moore, NE SW SE 36-26n-5w, northwest offset to the Carter well, and the other by Producers Oil Co. at its 1 McConnell, SW NW SE 31-26n-4w, northeast of the Sinclair well.

Another new well for the recently revived old Webb pool in Grant County is indicated at Shell Oil Co., Inc., and Champlin Refining Co. 2-W Forsythe, SW NW SW 36-28n-3w. In a 90-minute drill-stem

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3,181,000 cu. ft., Berea sand, total depth 3,660 ft. A wildcat location in the Waterbury field has been made by Columbian Carbon Co. No. 1 C. W. Moore et al, elevation 771 ft. It is located on the Belleville Quadrangle, on the waters of Pond Creek, 2.10 miles south of latitude 39 degrees, .05 minutes, and 4.25 miles west of longitude 81 degrees, 30 minutes.

New locations reported in West Virginia were [illegible] ty; Clear Fork district, Raleigh County; Spencer district, Roane County; Buckhannon, Warren and Washington districts, Upshur County; and Steele district, Wood County.

In Amwell Township, Washington County, Pennsylvania, Carnegie Natural Gas Co. completed a good gas well in deepening operations in No. 682 Addison R. Hupp. It

XUM

...Coupee, and Vermilion parishes, while three wildcats were dry, one each in Beauregard, Lafourche and St. Mary parishes.

SOUTH LOUISIANA SUCCESSFUL WILDCATS

Jefferson Parish: New oil discovery, Manila Village—Tide Water Associated Oil Co. 1 State Lease 1299, in Sec. 25-18s-...

13,050 ft. open hole, IP: 157 bbl. oil per day through 6/64-in. choke, GOR 5,500, TP 7,900 psi., 39°-gravity.

Pointe Coupee Parish: New oil sand, Fordoche field—The Texas Co. 2 Cleland W. Dearing et al, 20-6s-8e, TD 9,037 ft., top sand 8,807 ft., perf. 8,807-14 ft., IP: 208 bbl. oil per day through 10/64-in.

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★Adjustable stroke length: 17" to 23".

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pool. Levels checked about the same as in those pools.

Bay Petroleum Corp. 1 Krone, SW SW SW 30-20-13, southeastern Barton County, had good saturation in the Arbuckle at 3,491-96 ft. and has run 5½-in. casing to the top of this formation at 3,490 ft. A drill-stem test was made of the zone but in this only 7 ft. of oily mud was recovered. The location is a mile northeast of the Rolling Green pool and 2½ miles south of the recently opened Sun Valley pool.

Testing also is under way at two wildcats in southwestern Rooks County. Francis Oil & Gas Co. 1 Wilson, NE NE NE 2-10-20, 2 miles southeast of the Northampton pool, had good shows and saturation both in the Lansing and Arbuckle. Lansing was topped at 3,508 ft. (—1,269 ft.), with shows at 3,574-77 ft. and 3,588-96 ft. Arbuckle was topped at 3,823 ft. (—1,584 ft.).

Lion Oil Co. 1 Mongean, NW NW NW 21-9-19, 1¼ miles south of the McClellan pool, also had good shows both in the Lansing and Arbuckle. Lansing was topped at 3,325 ft. (—1,204 ft.), and the Arbuckle at 3,631 ft. (—1,510 ft.). Total depth is 3,690 ft. with 5-in. casing on bottom.

Atlantic Refining Co. 3 McCandless, NE SE SE 30-25-13, a half mile east of the McCandless pool, southern Stafford County, has been given a bottom hole bomb potential rating of 1,342 bbl. per day. Production is from the Simpson sand through casing perforations at 4,248-60 ft. Top of the sand is 4,241 ft. (—2,231 ft.). Hole was drilled to 4,308 ft. in the Arbuckle.

J. P. Gaty 1 DeMoss, NW SW SW 7-26-3e, discovery well of the Butwick pool, western Butler County, has been given a drawdown potential rating of 3,000 bbl. per day following completion in the Mississippian, topped at 2,815 ft. (—1,467 ft.) Total depth is 2,865 ft., with casing at 2,856 ft.

The Paradise Creek pool in Rooks County has another maximum well in Cities Service Oil Co. 2-B Hilgers, CNL SE NE 31-9-18. It has been given a potential rating of 3,000 bbl. of oil per day from the Arbuckle at 3,577-79 ft. It is pumping through 5½-in. casing.

C. U. Bay 1 Burhle, SE SE NW 4-26-41, deep wildcat test in Hamilton County, has been abandoned. It was drilled to a total depth of 6,422 ft. in the Arbuckle, topped at 6,230 ft. (—2,809 ft.) Location is 15 miles west of the Hugoton gas field. It had the Topeka at 3,402 ft.; Lansing, 3,843 ft., Mississippian, 5,350 ft.; Misener, 6,120 ft., and Viola, 6,160 ft.

KANSAS SUCCESSFUL WILDCAT

Barton County: Aladdin Petroleum Corp. 1 Brodie, NW SW SE 23-19s-12w, IP 511 bbl. of oil per day from Arbuckle at 3,344-62 ft., TD.

KANSAS WILDCAT FAILURES

Hamilton County: C. U. Bay 1 Buhrle "C," SE SE NW 4-26s-41w, dry, TD 6,422 ft., Herrington 2,498 ft., Winfield 2,566 ft., Towanda 2,588 ft., Ft. Riley 2,620 ft., Wreford 2,720 ft., Topeka 3,402 ft., lime 3,843 ft., Mississippian 5,350 ft., Misener 6,121 ft., Viola 6,131 ft., Arbuckle 6,229 ft.

Pawnee County: Vickers and Gulf 1 Frizell, SW SW NW 4-22s-17w, dry, TD 4,040 ft.

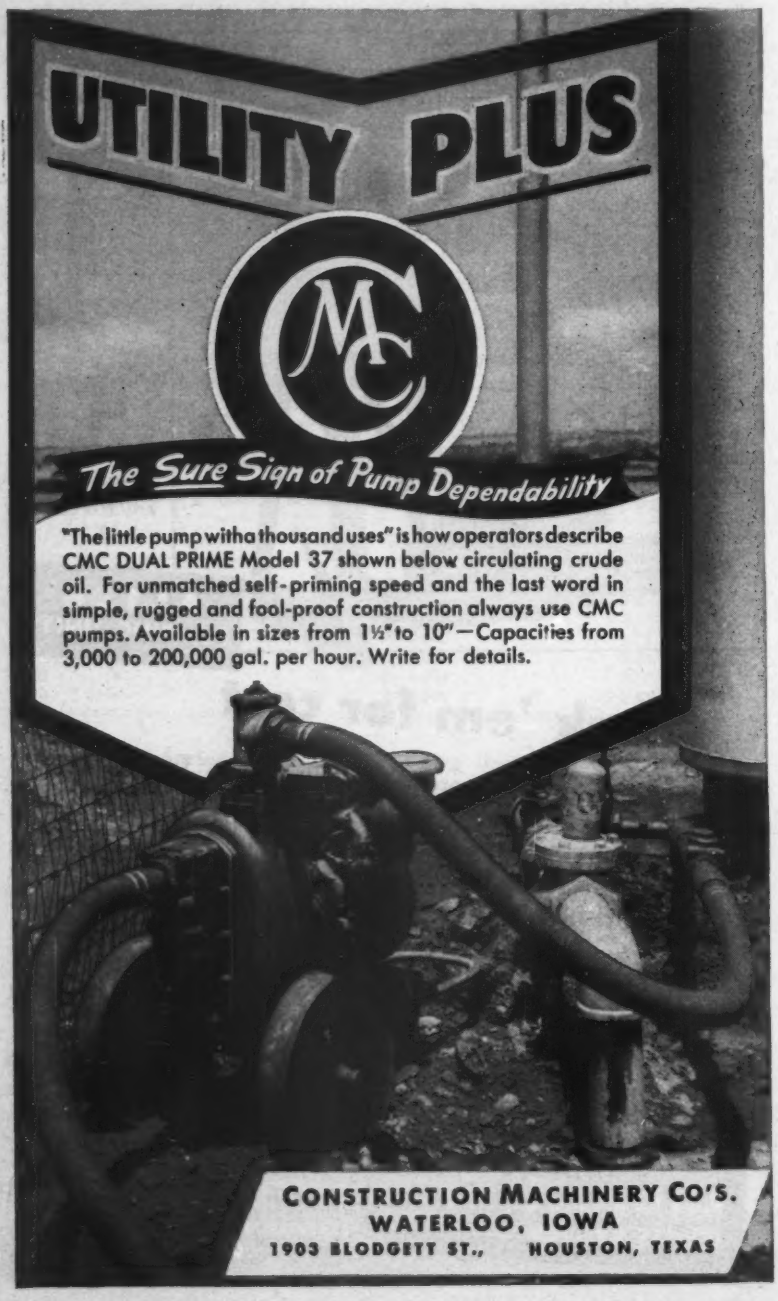
Pratt County: Lion Oil Co. 1 Newby, SE NE SW 11-26s-15w, dry, TD 4,610 ft., lime 3,846 ft., conglomerate 4,171 ft., Kinderhook 4,288 ft., Viola 4,345 ft., Simpson 4,516 ft., Arbuckle 4,471 ft.

Rooks County: Harry Gore 1 Nichol, SW SE SW 5-6s-20w, dry, TD 3,646 ft., Topeka 3,123 ft., Heebner 3,324 ft., Dodge 3,344 ft., Reagan 3,606 ft., granite wash 3,607 ft., solid granite 3,644 ft.

Russell County: Nadel & Gussman 1 Davis, NE NE NE 26-12s-15w, dry, TD 3,308 ft., Lansing 2,994 ft., Arbuckle 3,283 ft.

Jones & Shelburne et al 1 Gorham, NW NW NW 21-13s-15w, dry, TD 3,297 ft., anhydrite 880 ft., Topeka 2,731 ft., Heebner 2,954 ft., Lansing 2,999 ft., Arbuckle 3,264 ft.

Rine Drilling Co. 1 Fred Schmidt, NE NE NE 32-13s-13w, dry, TD 3,408 ft., anhydrite 815 ft., Topeka 2,953 ft., Lansing 3,018 ft., conglomerate 3,328 ft., Arbuckle 3,350 ft.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MISSISSIPPI

LaGrange Field Gets ½-Mile North Extension

JACKSON. — The LaGrange field, Adams County, was extended approximately ½ mile north with the completion of Humble Oil & Refining Co. 1 Bessie Moore, 66-7n-2w. On initial production test the well flowed 111 bbl. of 38.4°-gravity oil through a ½-in. choke, tubing pressure 420 psi. and casing pressure 520 psi. Production is through perforations at 6,070-80 ft. in Baker (Wilcox) sand.

Gulf Refining Co. 19 Andrews, 6-1n-16w, in Baxterville field, Lamar County, has been completed for an initial production of 50 bbl. of 15.3°-gravity oil per day through a ¼-in. choke. Tubing pressure 150 psi. Total depth is 8,897 ft. Production is through 294 perforations in interval from 8,694 ft. to 8,826 ft.

In Pine Ridge field, Adams County, Phillips Petroleum Co. 1 Pearline, 36-8n-2w, was completed for an initial production of 107 bbl. of 41°-gravity oil per day through a 13/64-in. choke. Production is through perforations at 5,604-14 ft.

Humble 1 Alice West-Masonite Corp. et al, 13-9n-8w, in Yellow Creek field, Wayne County, was completed for an initial production of 178 bbl. of 19.8°-gravity oil per

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Modern Refining Processes (George Amistead, Jr.)	1.00
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A wildcat of importance in the central Montana area has reportedly found a large flow of gas in the lower Ellis-upper Amsden contact zone. The well is Wm. Hanlon 2 Government, NE SW NE 9-10n-22e, on Devils Pocket, western Musselshell County. The gas was reported at 33,000,000 cu. ft. between 1,405-10 ft., and the well was drilled to 1,415 ft., total depth.

New locations.—There ware 10 new locations, 8 in Wyoming and 2 in Montana, during the week. In Wyoming Husky Refining Co. and Ohio Oil Co. made location for 1 Arminto, SW NE NE 10-37n-86w, in the Lox-Arminto area. The well will be a Tensleep test. Stone-Ogle Co. made location for a wildcat in the East Skull Creek area, Weston County, for another test in the so-called "trend" area on the east side of the Powder River Basin.

Completions.—There were 15 completions, with a total daily initial of 1,690 bbl. of oil. Eight of the wells were in Wyoming, 5 in Montana and 1 each in Colorado and Utah. The Utah completion was a wildcat failure by Seaboard Oil Co. in the Bitter Creek area, eastern Utah. The well was completed in Tertiary beds and failed to find commercial production in thin sands of that formation. In Wyoming Atlantic Refining Co. completed its discovery in the Riverton area for a gage of 485 bbl. of oil daily through ¾-in. choke with total depth at 11,884 ft. in the Tensleep. W. E. Arkinson abandoned the Morrisey area wildcat, between Mush Creek and Ant Hills fields,

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Weston County, after failing to find production through the Morrison.

WILDCAT SUCCESS IN WYOMING

Riverton, Fremont County: Atlantic Refining Co. 1 Tribal, SW SE 25-1s-4e, 11,884 ft. TD, flowed 485 bbl. oil per day through ¾-in. choke, 48.2° gravity, Cody 4,350, Frontier 7,950, Muddy 9,238, Dakota 9,385, Morrison 9,486, Gas sand 9,525 Sundance 9,773, Nugget 10,095, Chugwater 10,346, Dinwoody 11,315, Phosphoria 11,370, Tensleep 11,665 ft.

WILDCAT FAILURE IN WYOMING

Morrisey area, Weston County: W. E. Atkinson 1 Government "A," SW SW SW 15-41n-63w, 5,520 ft. TD, abnd., no Newcastle sand, Dakota 5,354, Fuson 5,447, Lakota 5,465, Morrison 5,473 ft.

WILDCAT FAILURE IN UTAH

Bitter Creek, Uinta County: Seaboard Oil Co. 1 Unit, NW SW NW 10-10s-22e, 8,520 ft. TD, abnd.

OKLAHOMA

Rich Valley Field Gets Second and Third Wells

THE second well for the new Rich Valley field in Grant County has been completed, and a third is in process of completion. Carter Oil Co. 1 Moore-Daniel, SW SE SE 36-26n-5w, northwest offset to the discovery well, flowed 285 bbl. of 47.5° clean oil in 5 hours on production gage through ¾-in. choke. Production is from two zones of the Wilcox. The lower zone, the Marshall sand, is flowing from open hole at 5,833-44 ft. The upper zone is the Simpson dolomite, in which casing was perforated at 5,780-5,806 ft. The latter was acidized with 2,000 gal. Gas-oil ratio on the production test was 1,070 cu. ft. per barrel.

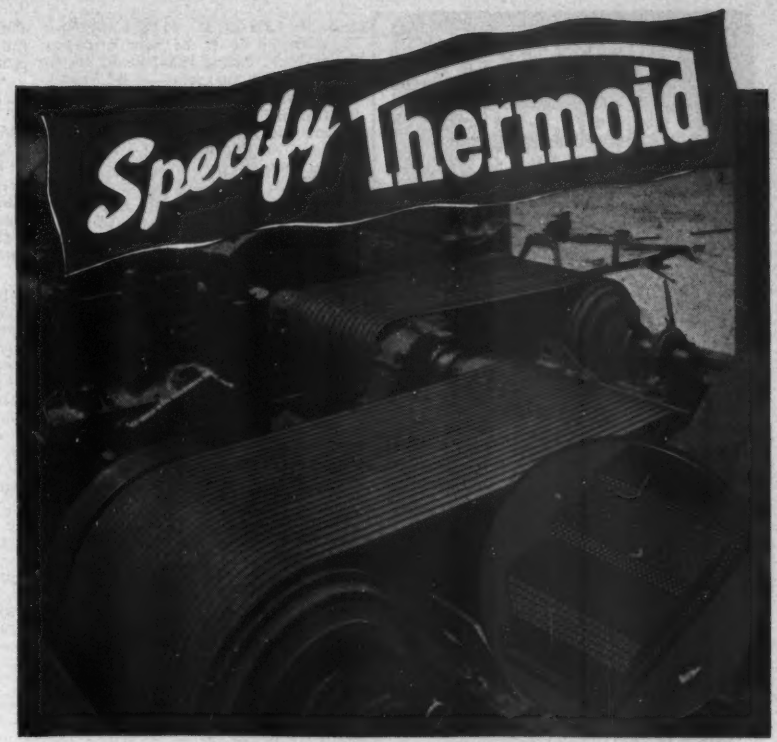
Sinclair Prairie Oil Co. 1 Ruzek, SW SW SW 31-26n-4w, northeast offset to the discovery well, also is expected to make a good well. On a 60-minute drill-stem test at 5,842-52 ft. in the Marshall zone (second Wilcox), it flowed at an estimated rate of 25 bbl. of oil per hour and 250,000 cu. ft. of gas per day. Gas showed in 3 minutes and oil started flowing in 54 minutes after the tool was opened. After running electric log, 7-in. casing was cemented at 5,850 ft., 2 ft. off bottom. At latest report, plug was being drilled preparatory to perforating casing.

The Sinclair well also had showings in the Simpson dolomite although a drill-stem test in this was not too favorable. The latter zone was tested at 5,799-5,819 ft. with the testing tool open 65 minutes. Gas showed in 11 minutes and flowed at an estimated rate of 30,000 cu. ft. daily. When tool was pulled, 325 ft. of 46.4° distillate and 25 ft. of gas and distillate-cut mud was recovered.

The field was discovered by Mid-Continent Petroleum Corp. and Viersen-Cochran 1 Vollmer, NE cor. 1-25n-5w, which flowed 705 bbl. in 14 hours through ½-in. choke on initial production test. Its pay is the Marshall zone with flow from open hole at 5,829-48 ft. Two dry holes, one to the south and the other southeast of the discovery well, leave the two new wells to establish the production trend to the north.

Two new operations already have been started, one by Mid-Continent Petroleum Corp. and Viersen-Cochran at their 1 Moore, NE SW SE 36-26n-5w, northwest offset to the Carter well, and the other by Producers Oil Co. at its 1 McConnell, SW NW SE 31-26n-4w, northeast of the Sinclair well.

Another new well for the recently revived old Webb pool in Grant County is indicated at Shell Oil Co., Inc., and Champlin Refining Co. 2-W Forsythe, SW NW SW 36-28n-3w. In a 90-minute drill-stem



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test at 4,332-38 ft. in the Misener sand. It recovered 60 ft. of heavily oil-cut mud. Seven-inch casing has been set at 4,333 ft., 1 ft. in the sand.

The north end of the East Lindsay field in Garvin County has been extended a 40-acre location westward by Magnolia Petroleum Co. 1 Mantooth, C NE NW 2-4n-4w, which flowed on completion 703 bbl. of 45.3° clean oil in 24 hours through ½-in. choke from the Bromide. Casing was perforated at 10,256-70 ft.; 10,330-45 ft., and 10,362-10,420 ft. Total depth is 10,456 ft., plugged back to 10,432 ft. Gas-oil ratio was 2,582 cu. ft. per barrel.

Two miles to the south and east of the Magnolia well, Cities Service Oil Co. got another good well in its 1 McKee, C NE NW 27-5n-4w, in McClain County, which flowed 298 bbl. of oil through various chokes ranging from ½-in. down to 16/64-in. Production is from open hole through the first and second Bromide sands with total depth at 11,131 ft. and 7-in. casing at 10,885 ft. A half mile east, Anderson-Prichard Oil Corp. completed 1-A Gray, C NE NE 27-5n-4w, flowed 195 bbl. in 9 hours through ½-in. choke from the same pay at 10,895-11,136 ft.

Magnolia Petroleum Co. 2 Seeley, NW NE NE 24-5s-1w, east flank of the Brock pool, Carter County, deepened 8 ft. from 4,192 ft., where it was an excessively high ratio well, has been completed flowing 208 bbl. of 31.5° oil in 14 hours through 25/64-in. choke with a ratio of 688 cu. ft. per barrel.

Rock Hill Oil Co. and Eason Oil Co. 1 Moyer-Scrivner, SE NW NW 1-5s-2w, south flank step-out test for the Bayou pool, Carter County, has discovered a new and deeper sand in the Lone Grove series. In a 60-minute drill-stem test in the sand at 4,265-99 ft., it started flowing, and, when pipe was pulled, 4,060 ft. of oil and 60 ft. of oil-cut mud was recovered. Electric log showed sand at 4,262-78 ft. and 5½-in. casing has been cemented on top. Location is south of Continental Oil Co. 1 Sullivan, completed last month as a 445-bbl. well in the Chubbee sand at 2,900-3,014 ft.

C. P. Quinlan is opening a new Bartlesville sand pool south of Orlando in western Payne County. His 1 Lowe, NE NW SW 21-19n-1w, on a 40-minute drill-stem test at 4,911-18 ft. showed gas in 16 minutes and in pulling pipe recovered 170 ft. of pipe line oil and 30 ft. of heavily oil-cut mud. Indicated bottom-hole pressure was 1,700 psi. With 7-in. casing cemented at 4,905 ft., a drilling-in unit is being moved in to complete.

OKLAHOMA SUCCESSFUL WILDCATS

Garvin County: Sohio 1 Moore, C NW NW 17-4n-3w, flowed 635 bbl. of 42°-gravity oil per day from first bromide sand at 9,630-56 ft., TD 10,685 ft.

Cooper 2 Lewis, SE SW SW 17-3n-3e, pumped 59 bbl. of 31°-gravity oil per day from sand at 2,065-90 ft., TD.

Logan County: Snowden 1 Fry, C NW NW 4-18n-4w, flowed 51 bbl. of 42.6°-gravity oil per day from Tonkawa at 4,049-59 ft., TD 4,962 ft.

Pottawatomie County: Aston 1 Neal, NE SE NE 30-6n-3e, pumped 35 bbl. of oil per day from Layton at 3,106-24 ft., TD 4,625 ft.

OKLAHOMA WILDCAT FAILURES

Atoka County: California 1 Bishop, SW SW NW 30-3s-10e, dry, TD 5,200 ft., Wapanucka 1,917 ft., Springer 2,090 ft., Mississippian Caney 2,400 ft., Mayes 2,795 ft., Woodford 2,845 ft., Hunton 3,078 ft., Sylvan 3,203 ft., Viola 3,447 ft., bromide dense 3,848 ft., McLish 4,295 ft., Oil Creek 4,600 ft.

Cotton County: Atkinson 1 Nowlin, SE SW SE 26-4s-11w, dry, TD 2,202 ft., Megargel lime 1,875-1,910 ft., Gunsight 2,162-76 ft.

Ross 1 Hall, NW NE NW 16-5s-12w, dry, TD 1,865 ft., fusilinid lime 1,533-40 ft., sand 1,774-76 ft., with slight show of oil, Megargle 1,845-57 ft.

Farris 1 Elkins, SE SE NW 14-5s-13w, dry, TD 1,900 ft., sand 1,460-85 ft., 1,570-88 ft. and 1,685-88 ft., all no shows, fusilinid lime 1,688-92 ft., sand 1,745-69 ft., 1,832-36 ft. with slight show of oil, and 1,840-42 ft., shale and shells 1,842-1,900 ft.

Creek County: Davon 1 Wilkenson, NW SW NE 31-14n-8e, dry, TD 3,731 ft., Hogshooter 1,100 ft., Checkerboard 1,502 ft., Oswego 2,410 ft., Prue 2,585 ft., Skinner 2,760 ft., lime 2,980 ft., Dutcher 3,404 ft., Mississippi lime 3,599 ft.

Hughes County: Pine 1 Stevenson, NE SE SE 35-5n-11e, dry, TD 2,901 ft., no shows.

Konawa 1 Cain, NE SE NW 25-7n-8e, dry, TD 968 ft., Calvin 957 ft.

Jackson County: McCormick 1 Holcomb, NE NE SW 6-1n-19w, dry, TD 1,604 ft.

Johnson County: Lewis 1 Anderson, NW NW SW 4-4s-4e, dry, TD 3,592 ft.

Kay County: Cities Service 1 Nichols, NE SE SW 34-29n-1w, dry, TD 3,880 ft., Tonkawa sand 2,450 ft., Layton 2,860 ft., Big lime-Oswego 3,257 ft., Mississippi lime 3,495 ft., Woodford 3,622 ft., Wilcox 3,658 ft., Arbuckle 3,808 ft.

Lincoln County: Kemp 1 Haskins, SW SW SW 19-17n-6e, dry, TD 3,400 ft., Inola 3,320 ft., Bartlesville 3,351 ft.

Noble County: Berry 1 Schneck, SE SE SE 35-21n-3e, dry, TD 3,891 ft., Tonkawa 2,362 ft., Avant-Dewey 2,573 ft., Layton 2,690 ft., Hogshooter 2,850 ft., lower Layton 2,952 ft., Checkerboard 3,227 ft., conglomerate 3,280 ft., Big lime 3,424 ft., Oswego 3,552 ft., lower Skinner 3,758 ft., lime 3,791 ft., Red Fork 3,820 ft.

Donahue 1 Little Crow, NE SW SE 36-22n-2e, dry, TD 4,423 ft., Tonkawa 2,175 ft., Avant 2,530 ft., Perry gas sand 2,535 ft., Layton 2,958 ft., Hogshooter 3,040 ft., lower Layton 3,110 ft., Checkerboard 3,440 ft., Oswego 3,560 ft., Skinner 3,880 ft., lime 3,887 ft., Bartlesville 3,907 ft., Mississippi lime 4,125 ft., Woodford 4,326 ft., Viola 4,365 ft., dolomite 4,384 ft., first Wilcox 4,400 ft., second Wilcox 4,412 ft.

Okfuskee County: Woods 1 Crane, SW SW

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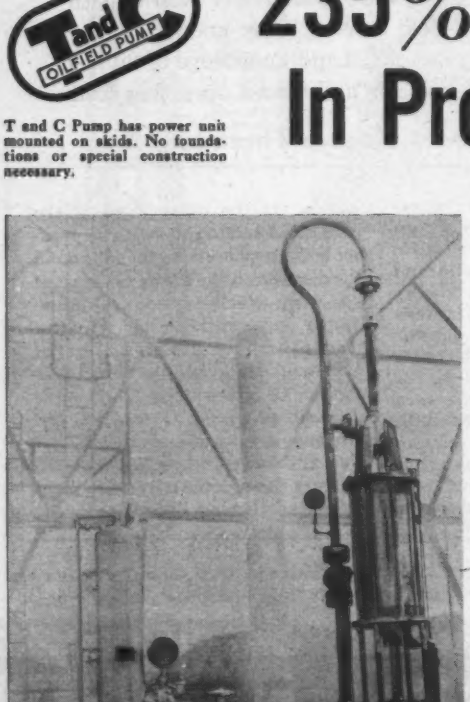

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NE 8-13n-7e, dry, TD 4,041 ft., Red Fork 3,102 ft., Dutcher 3,564 ft., Mississippi lime 3,936 ft., Woodford 3,996 ft., Hunton 4,030 ft.

Pawnee County: McIntyre 1 Blaine Peters, NW SW SW 32-21n-6e, dry, TD 3,058 ft., Prue 2,904-42 ft., Skinner 3,028-47 ft., sandy shale 3,047-58 ft.

Seminole County: Wiser 1 Bakhaus, NE NE SW 1-11n-7e, dry, TD 4,537 ft.

Stephens County: Atkinson 1 Edwards, SE NW SE 3-3s-6w, dry, TD 2,248 ft., lime 2,169 ft.

CALIFORNIA

Grass Roots Drilling in Tejon Hills Picking Up

LOS ANGELES.—An extensive drilling campaign is expected to get underway in the Tejon Hills area of Kern County as the result of outpost completions in three directions from the Tejon Hills fields at the extraordinarily shallow depth of 600-700 ft. An added feature is the gravity of oil which runs from 28° to 30°. Drilling to date has been by small independent companies and while this is known colloquially as a "poor man's oil field," at least one major, Richfield Oil Corp., is entering the area.

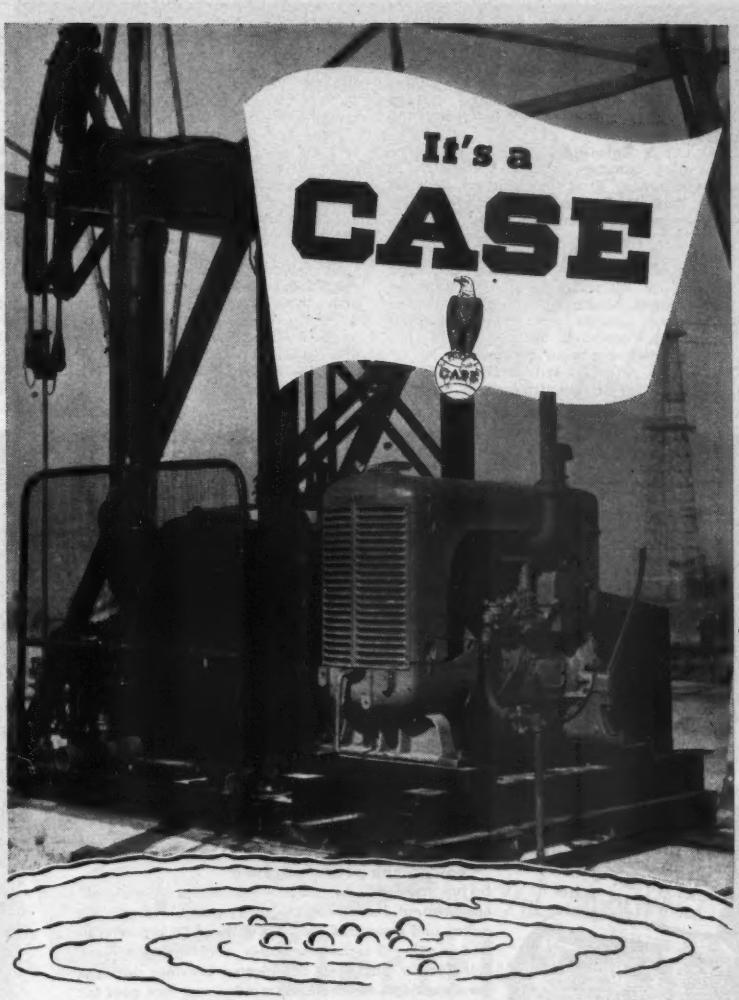
Latest completion is Rainbow Oil Co. 4 Rainbow, Section 11-11n-18w, which was brought in on the pump this week for 75 to 100 bbl. a day of 28°-gravity oil. Total depth is 678 ft. with top of the oil sand at 620 ft. Original Tejon Hills discovery was made last July by Tejon Hills Oil Co., which completed its 2 Tejon Hills, 10-11n-18w, for 45 bbl. a day of 30.8°-gravity oil. Top of the sand was logged at 380 ft. Eight wells were subsequently completed. Interest of other operators lagged, however, until early this year when Steele Petroleum Co. stepped out 1 mile south of production and brought in a 65-bbl. pumper from 648 ft. Last month, Tejon Hills Oil Co. extended production ¾ mile to the east. This week's completion by Rainbow Oil Co. is in turn about ½ mile northeast of the Tejon Hills Oil Co.'s outpost well and is 104 ft. higher structurally.

Richfield Oil Corp. has extended production in the North Coles Levee field of Kern County about ½ mile to the east by the completion of its 18-26 Houchin B, Section 26-30s-25e. Production to date, however, has not been impressive, the flow being by heads at a rate of 80 bbl. a day of 32.1°-gravity oil from plugged depth of 9,435 ft.

Another outpost test in the Cuyama Valley was abandoned this week when Eagle Oil & Refining Co. failed to find the pay in its No. 1 well, 7½ miles due west of the Russell Ranch field in 26-11n-29w. The well was bottomed in the Cretaceous at 5,531 ft. A production test in Richfield Oil Corp. 1 Perkins outpost, 27-10n-26w, about 10 miles southeast of production, has been delayed due to a strong water entry at the shoe of the 7-in. casing. Richfield which discovered the Cuyama Valley's Russell Ranch field, biggest California find in 1948, recently stated that it had under lease or contract in the Valley about 92,200 acres and holds options on 65,700 additional acres. The region is very complicated geologically and a great deal of time and work will be required to finally measure the magnitude of the productive area.

Several interesting wildcat locations were made during the last wek, especially in Monterey County where oil was discovered for the first time last year. Texas Co. will drill 1 Davies, a rank wildcat, about 6 miles northwest of Salinas and 1 mile east of Castroville in Section 34-13s-2e. Superior Oil Co. is preparing to spud 1 Trescony about 9 miles northwest of San Ardo production in 32-21s-9e.

In the Summerland area of Santa Barbara County, Standard of California will attempt to evaluate the importance of a gas discovery made there last October when it com-



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pleted 1 Williams, 16-4n-26w, for 2,155,000 cu. ft. of gas through an 18/64-in. choke from 3,200 ft. This well produced as high as 10,000,000 cu. ft. daily before being shut in. The new test, to be called 1 Ortega Community, is about ½ mile from the discovery well.

Eagle Oil & Refining Co. has a 5,000-acre wildcat play coming up near Calabasas in Ventura County. First exploration will be on the Barrett Ranch where three tests have been programmed. The first of these will fall on the west half of Section 4-1n-17w.

Sporadic attempts to develop production north of the Huntington Beach field in Orange County continue, with negative results to date. Latests test to be projected is Shell Oil Co.'s 5-22 Kettler, 22-5s-11w, about 1½ miles north of production.

The Termo Oil Co. will drill a wildcat approximately 3 miles southwest of the San Emidio discovery well, Apex Petroleum Corp.'s 3 Los Lobos, completed a year ago in Kern County at 1,481 ft. (Vaqueros) for 30 bbl. of 28°-gravity oil per day. The Termo test, 1 Robinson, will be drilled in 11-10n-23w.

Natural Gas Corp. is preparing to drill a test for gas, the 2 Moffat, Section 1-12s-14e, near Firebaugh in Madera County. This falls about 1 mile northwest of Texas Co.'s 7 Moffat gas producer, completed in 1943, and also about ½ mile northeast of Texas Co.'s 47-1 Moffat, abandoned in 1944 at 3,996 ft.

New locations in California to date this year are running about 6 per cent above a year ago. Sixty-three locations were filed with the State Division of Oil and Gas last week, making the total for the year to date 744, against 701 to the same date a year ago.

CALIFORNIA WILDCAT COMPLETIONS

Kern County, Dyer Creek area: W. R. Gerard 1 Cairns, 11-26s-27e, pumped 50 bbl. daily, 16°-gravity oil, 0.1 per cent water cut, elev. 885 ft., TD 2,305 ft.

Humboldt County, Mattole Valley area: Paul L. Snyder 1 Etter, 36-2s-1w, pumped 2 bbl. daily 38.6°-gravity oil, 0.2 per cent water cut, elev. unknown, TD 1,933 ft.

CALIFORNIA WILDCAT FAILURES

Kern County, Round Mountain area: E. A. Bender 1 Bender-Barlow, 24-28s-28e, dry, elev. 958 ft., TD 2,400 ft.

Bradford Bishop 1 T.P.R., 14-28s-28e, dry, elev. 922 ft., TD 2,668 ft.

D G MacGregor 1 MacGregor, 26-28s28e, dry, elev., 707 ft., TD 3,001 ft.

Tejon area: T. & E. Drilling Co. 3, 14-11n-18w, dry, elev. 1,098 ft., TD 766 ft.

Santa Barbara County, Cuyama Valley area: Eagle Oil & Refining Co. 1, 26-11n-29w, dry, elev. 2,300 ft., TD 5,607 ft.

Richfield Oil Corp. A-1 Wegis-Reyes, 9-9n-24w, dry, elev. 2,774 ft., TD 6,049 ft.

Solano County, Davis area: Shell Oil Co., Inc., 1-1 Davis Unit, 10-7n-1e, dry, elev. unknown, TD 6,500 ft.

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CANADIAN FIELDS

Golden Spike Water Line Still Not Found

CALGARY.—The Golden Spike oil discovery, Imperial Schoepp No. 1, has not as yet reached the water level and still has a small amount of oil oozing from its formation. However, after 544 ft. of highly productive oil zone was encountered, there was found a 78-ft. section of apparently tight lime containing no water but also not willing to give up much oil or gas.

Latest test from 5,965-5,985 ft. gave an initial puff and a faint air blow lasting throughout the 1-hour test. Pipe recovery consisted of 5 ft. of oil and 5 ft. of oil-cut mud, no water. Coring and testing will continue over the weekend.

The Superior Joseph Lake No. 1 Viking sand oil discovery is performing satisfactorily under restricted flow conditions. The well, on a 30-day experimental production test, is operating primarily through a 10/64-in choke. Flow during latest 24-hour run was 53.2 bbl. with cut of 1.4 per cent. Pressures recorded were: casing 689 psi., tubing 236 psi., separator 106 psi. The measured gas-oil ratio was 858 cu. ft. per barrel. Six days previous to that test the yield was 89.4 bbl. with a 1.2 per cent cut; casing pressure averaging 690 psi., tubing 325, and separator 100. On open flow, Superior Joseph Lake rated an initial potential of 528 bbl. (through ½-in. choke). Location is in LSD 11, 22-50-22w4, 18 miles southeast of Edmonton.

Leduc.—Flank - Leduc 1, LSD 14, 18-50-26w4, located on the far west side of the Leduc field, assured success in D2 zone of Devonian, when it flowed oil to the surface in 18 minutes.

D2 was topped about 5,095 ft. (K.B. elevation 2,341 ft.) The well was cored to 5,172 ft. and drill-stem test made of that section from 5,096 ft. There was a fair gas blow with flow of oil reaching the surface in slightly over 17 minutes. The 7-in. casing has been set at 5,097 ft. with 250 sacks. The well will be placed on production test within the next few days.

Flank-Leduc is located on a quarter section secured by Flank Petroleums, Ltd., of Calgary from Imperial Oil, Ltd., under a development agreement. Only consideration to Imperial is a small royalty on production (maximum 5 per cent).

Redwater.—The British American Oil Co. and Hudson's Bay Oil & Gas Co. team is now completing its first oil success on its Crown Reserve section 30 lease at Redwater, and is readying to complete its second success on the tract.

B.A.-H.B.-Redwater No. 16-30, in LSD 16, 30-57-21w4, was completed at 3,242 ft. after setting 7-in. casing at 3,128 ft., and was kicked off by swabbing. After brief runs to clear formations, the well com-

pleted a 20-hour flow run yielding 752 bbl., a daily rate of 900 bbl. Crew is now preparing to acidize.

Ellscott.—Stanolind Oil & Gas Co. is abandoning its Stanolind - Ellscott No. 1 wildcat, LSD 8, 16-64-20w4, located about 145 miles northeast of Edmonton. The hole was drilled to 2,428 ft. and then plugged back for test of upper formations. Perforations were carried out from 2,092-2,120 ft., and from 1,732-40 ft. Both perforated sections were tested separately and water was the result in each case. Crew is now plugging and abandoning the hole.

Joncs.—Imperial Oil, Ltd., has staked another wildcat in northern Alberta. The latest venture, Imperial-Joncs No. 1, will be drilled in LSD 16, 11-61-26w4, 1½ miles northwest of Lac des Joncs and just over 50 miles north of Edmonton.

Lac La Biche.—Stanolind Oil & Gas Co. has completed killing and abandoning its wild gasser. The well was killed by water flooding through a relief hole directionally drilled down to the Viking sand. The heavy gas flow was first shut off by pumping through the relief hole some 1,400 bbl. of water. Killing and abandonment was completed by pumping in a further 800 bbl. of water, 694 sacks of baroid, 67 sacks of aquagel, and 300 sacks of cement.

CANADIAN WILDCAT FAILURES

Imperial-Gilbert No. 1, LSD 3, 18-51-25w4, TD 4,369 ft.

Bear-Vampire No. 2, LSD 4, 32-93-10w4, TD 883 ft.

LA.-ARK.

Union County Test Gets No More Shows

SHREVEPORT.—Macmillan Petroleum Corp. 1 Nash, SE NW 35-18s-15w, Union County, Arkansas, wildcat east of the El Dorado field, had total depth at 8,010 ft. No further oil had been reported since the drill-stem test at 7,763-77 ft. which yielded 90 ft. of oil and 60 ft. of salt water. A core from 7,867-7,912 ft. recovered 45 ft. of broken lime having some porosity and gas taste, but a 30-minute drill-stem test of the same interval recovered the 1,000 ft. of water cushion, plus some 6,000 ft. of salt water. Cores on to 8,010 ft. had no shows. On an elevation of 240 ft., top of the Smackover was logged at 7,760 ft. Surveys were being run to total depth.

Bossier Parish.—Barnsdall Oil Co. 1 Ardis, 27-22n-11w, placed the Bodcaw section at 8,708-32 ft., which last week yielded some distillate on a drill-stem test from 8,710-52 ft. It was drilled and cored ahead. At 8,990-9,037 ft., the recovery was 17 ft. of shale, then 5½ ft. of sand with light gas shows, and 24 ft. of shale with no shows. From 9,165-9,213 ft. the recovery was approximately 18 ft. of sand with fair to good distillate odor, and some stains; 5½ ft. of shale, 14½ ft. of fine-grained sand with gas odor, and 6½ ft. of shale. A drill-stem test had not been reported, and operators were drilling ahead below 9,220 ft.

Caddo Parish.—S. M. Aronson 1 Sentell, 23-19n-14w, was drilling Travis Peak at 7,220 ft. C. H. Murphy, Jr., 1 Agurs, 7-16n-16w, recovered 140 ft. of gas-cut mud on an 8-hr. drill-stem test at 6,122-32 ft., in unidentified formation. Plug was set at 6,110 ft. and perforations, which tested dry, made at 6,074-88 ft. Plug was then set at 6,060 ft. and new holes made at 5,932-58 ft., which tested a small amount of gas. Acid treatment resulted in a flow of an estimated 900,000 cu. ft. of gas a day through ⅜-in. choke. It was to retreat with 2,000 gal.

NORTH LOUISIANA SUCCESSFUL WILDCAT

Winn Parish: Johnson & Nantz 1 Tremont, SE SE NE 26-12n-2w, pumped 4 bbl. oil and 26 bbl. water, open hole in Wilcox, 1,124-45 ft., TD.

NORTH LOUISIANA WILDCAT FAILURES

Claiborne Parish: H. W. Klein 1 A. H.

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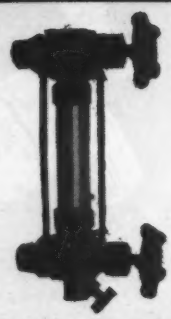

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Sims, NW SE 34-20n-5w, dry, TD 9,776 ft., James 5,145 ft., Travis Peak 5,872 ft., Cotton Valley 8,61ø ft., Bodcaw 9,123 ft., Vaughn 9,218 ft., elev. 201 ft.

DeSoto Parish: Potter Oils, Inc., 2 T. T. Tolson, NW SE 1-13n-16w, dry, TD 5,438 ft., base Austin 2,585 ft., lower Cretaceous 2,820 ft., Paluxy 3,130 ft., massive anhydrite 5,010-5,232 ft., Rodessa 5,312 ft., elev. 284 ft.

Richland Parish: J. R. Fitzhugh 1 J. C. Byargeon, NE SE NE 22-16n-7e, dry, TD 3,305 ft., Wilcox 1,327 ft., Midway 2,224 ft., Tuscaloosa 2,715 ft., Glen Rose 3,105 ft. lower Glen Rose 3,208 ft., elev. 85 ft.

Winn Parish: Continental Oil Co. 1 Mansfield, SE SW 34-13n-4w, dry, TD 10,558 ft., Wilcox 693 ft., Midway 2,085 ft., base Austin 4,390 ft., upper Glen Rose 5,278 ft., Rodessa 7,773 ft., Travis Peak 9,168 ft., elev. 173 ft.

PERMIAN BASIN

Scurry County Gets Six New Locations

MIDLAND.—Standard Oil Co. of Texas has announced locations for six new tests to be drilled in the North Snyder Canyon lime field of north-central Scurry County, with all scheduled to be under way by April 20. A southwest extension try is to be the 7-3 Brown, 647 ft. from south and west lines, 440-97-H&TC. Planned depth is 7,000 ft. Standard 5-3 Brown is southeast of the field, located 680 ft. from east, 1,960 ft. from south lines, 440-97-H&TC, to 7,000 ft. Standard 1-5 J. W. Brown, an east extension, is 680 ft. from west and 1,960 ft. from south lines, 441-97-H&TC, scheduled to 7,200 ft.

The other three wells are to be on the field's west side. The 1-6 J. W. Brown, 680 ft. from north and 660 ft. from west lines, 439-97-H&TC, is to 7,300 ft. No. 6-2 J. B. Brown is 1,960 ft. from north and 680 ft. from east lines, 439-97-H&TC, and the 1-7 Brown, 680 ft. from east and 1,960 ft. from south lines, 439-97-H&TC, is scheduled to 7,000 ft.

Two and one-half miles west and slightly north of the North Snyder field, Humble Oil & Refining Co. 1 Edmondson, NE NE NE 437-97-H&TC, was drilling ahead in lime and shale below 7,284 ft., after recovering water on a drill-stem test from 7,210-30 ft. The formation was identified only as Pennsylvanian.

Placid Oil Co. prepared to swabb at its 1 Early, prospective Strawn discovery, 6½ miles north of Snyder. Casing was set to 7,548 ft., total depth, plug drilled and perforations made from 7,520-45 ft.

Borden County.—Seaboard and Pan American's 1 T. J. Good, Canyon limestone discovery, gaged 17½ bbl. of 42.5°-gravity oil an hour, early this week, on a drill-stem test from 7,940-70 ft. Gas surfaced in 3 minutes, mud in 14 minutes and oil at the end of 16 minutes. It was allowed to flow and in 10 hours had tanked 176 bbl. An earlier test rated 22 bbl. of oil an hour from 7,920-40 ft. The additional 30 ft. of pay was cored after casing was set on bottom at 7,940 ft. Location of the discovery is 1,985 ft. from south and 2,004 ft. from west lines of Section 37-33-T4N-T&P. At last report, additional pay was indicated in a core to 7,985 ft.

Runnels County.—Flowing oil from Gunsite sand of the Cisco section of the Pennsylvanian was reported at George W. Strake, Houston, 1 B. A. Jacob, 4 miles northwest of Winters. Saturated sand was drilled from 2,811-25 ft. A 40-minute drill-stem test of the section brought gas to the surface in 4½ minutes and oil in 31 minutes. It cleaned into pits for 10 minutes at an estimated rate of 5 bbl. of oil an hour. Flowing pressure was 600 psi. Following that, a production test from 2,812-25 ft. averaged 7½ bbl. of oil an hour, flowing through ½-in. bottom choke and ¼-in. top choke. Total recovery was not reported. Length of the test was 1s hours. Operators were erecting two 1,000-bbl. tanks for further testing, and surveying for additional drill sites. Location is 4,585 ft. from south and 2,035 ft. from west lines, J. J. Hensley Survey 83.

Sterling County.—Four miles west of the Marvin field, Pan American Production Co. and Taylor Refining Co. 2 R. W. Foster, NW NE 10-13-SPRR, unloaded oil on a drill-stem test of the lower Permian from 5,473-89 ft. No estimate was made of the amount unloaded. The test lasted 1 hour and 13 minutes; gas came to the surface in 4 minutes and produced a good blow throughout the test. Bottom-hole flowing pressure was 600 psi. Recovery from the pipe was 1,050 ft. of 29°-gravity oil, plus 150 ft. of mud-cut oil, with no water. Drill pipe started unloading after 540 ft. had been pulled. Operators were running 5½-in. casing for further tests.

Gaines County.—C. H. Murphy & Co. 1 E. T. O'Daniel, wildcat test in NE SE 16-C44-PSL, proposed 5,700-ft. test, had prospects of extending San Andres production about 2 miles southeast of the Seminole field. A 2-hour drill-stem test from 5,281-5,311 ft. recovered 50 ft. of oil and gas-cut mud. On an elevation of 3,268 ft., sample top of the San Andres was tentatively placed at 5,000 ft. A core from 5,260-5,310 ft. was said to have had 6 ft. of saturated lime on bottom. Operators were coring ahead below 5,323 ft.

WEST TEXAS (DISTRICTS 8 & 7-C) WILDCAT FAILURES

Andrews: County Southern Minerals Corp. 1-A University, NW NE 11-13-University Lands, 1½ mi. NW Shafter Lake Devonian field, dry, TD 8,445 ft., San Andres 4,527 ft., Glorietta 5,760 ft., Wolfcamp 8,434 ft., elevation 3,266 ft.

Crane County: Humble Oil & Refining Co. 1 J. M. Cowden, SE SE 58-X-CCSD&RGNG, 6½ mi. W Crane, dry, TD 11,032 ft., Clear Fork 4,180 ft., Tubb 4,540 ft., Devonian 6,768 ft., Ellenburger 10,615 ft., elevation 2,475 ft.

Gaines County: Magnolia Petroleum Co. 1 W. C. Hicks, NW NW Tract 16, League 273, Loving CSL, 14 mi. SW Lamesa, dry, TD 13,271 ft., Mississippi 11,350 ft., Devonian 12,318 ft., Ellenburger 13,102 ft., elevation 2,986 ft.

Pecos County: Hancock & Phillips 1 Lowery & Wilson, 7-Z-TCRR, 10 mi. W Iraan, dry, TD 2,031 ft. in lime.

Reagan County: Atlantic Refining Co. 1-48-A University, approximately SW SE 18-48-University Lands, 2 mi. S Barnhart,

(Continued on page 173)

ILLINOIS

Gallatin County Has Good Prospect

MATTOON.—The north-central part of Gallatin County has a prospective Hardinsburg producer at J. L. Crawford 1 Sutton, SW SW NE 6-8s-10e, where the operator is cleaning out after shooting the pay at 2,302-25 ft. Local reports indicate that the well may be good for about 100 bbl. per day. The well is northeast of Inman pool and about 2½ miles south of New Haven. A show of oil was also reported for the Tar Springs.

Carter Oil Co. had another good well in the area north of North Thompsonville pool in Franklin County. The well, Carter 3 Trustees Tract 16, SW SE SW 3-7s-4e, was completed in the Aux Vases at 3,104-22 ft. for 288 bbl. per day on pump. The pay zone was given a 60-qt. shot.

In Jefferson County, Gulf Refining Co. has a good McClosky showing in a well on the southeastern side of East Divide pool. The well, Gulf 1 Willie, NW NW SE 21-1s-4e, is reported to be pump testing the McClosky at 2,778-87 ft., and on late report pumped 375 bbl. in 16 hours.

Don Baines 1 Charles Schonert, SE SE NW 16-3n-10e, is going on pump to test the Rosiclare at 3,062-92 ft. The well is about 2 miles south of Olney.

ILLINOIS WILDCAT FAILURES

Christian County: F. A. Bridge 1-A Davis, SE SE SE 22-15n-2w, dry, TD 1,920 ft.

Clay County: J. L. Black 1 Bryant, SW SW NE 7-2n-5e, dry, TD 3,029 ft.

Jasper County: D. Miller 1 W. Wilson, SE NE SE 10-5n-10e, dry, TD 2,946 ft.

Macon County: Perry Fulk and Roy Snider 1 R. A. Day, NE NE NW 14-14n-1e, dry, TD 1,269 ft.

OHIO, KENTUCKY

Four Gas Fields Get Good Extensions

COLUMBUS.—The Brendel Producing Co. 1 (Eberhart) Robinson Clay Products Co., Section 17, Lawrence Township, Tuscarawas County, came in at 3,297,000 cu. ft. and was tubed natural. The well is ¼ mile north of the 1 Streb and the sixth well in the pool. White Clinton was logged at 4,662-4,705 ft.

The Ruggles Township gas pool in Ashland County was extended a location to the west by the E. A. Fierbaugh et al 1 Cloyd Peters, Lot 44. Clinton at 2,460-64 ft. made 877,000 cu. ft. natural and 1,060,000 cu. ft. when shut in after shot.

The Fritz O. & G. Co. 1 Dorathy Baughman, Section 23, Brush Creek Township, Muskingum County, widens the Irish Ridge pool ¼ mile to the south. Clinton sand was topped at 4,142 ft. and drilled to 4,167 ft. with an open flow of 2,600,000 cu. ft. natural.

The inactive shallow sand field in Meigs County received a boost by the completion of the Ohio Fuel 1 Wm. Nicholson, Section 29, Rutland Township. Maxon sand was reached at 843 ft. and drilled 3 ft. in with a natural open flow of 1,690,000 cu. ft.

Benedum-Trees' St. Peter wildcat east of Cleveland in Mayfield Township, Cuyahoga County, is reported as having a good showing of oil and is to be acidized.

The seasonal increase in activity has not yet taken place and only nine new locations from seven counties were reported for the week. Muskingum and Meigs counties had two each. Completions totaled 21 with Ashland field in the lead with 6.

OHIO WILDCAT FAILURE

Coshocton County, Clark Township: Oxford Oil Co. 1 P. W. Gamertsfelder, Sec. 13, Clinton 3,387-3,445 ft., TD 3,524 ft.

EASTERN KENTUCKY

ASHLAND.—In southern Fleming County, 14-V-71, Ed Lillie et al are trying to exhaust water from their 2 John Riley. Well has been pumping on the beam now for some days but fluid level has not dropped. Either bottom-hole water is being had or packer has failed to hold. Operators continue testing.

In the Furnace gas field of Estill and Powell counties, Petroleum Exploration Co. has completed 1 Hobart Tipton, 22-P-68, Powell County, for 9,105,000 cu. ft. of gas per day from St. Peter sand at 2,528-51 ft., total depth. Corniferous lime was missing in this test, Brassfield was topped at 895 ft., Lexington at 1,642 ft., and Tyrone lime at 1,855 ft.

In Pulaski County, 15-G-60, Onie Hamilton et al are drilling at 1,677 ft. on 1 Dora Hamm, a Knox wildcat test for the region.

WESTERN KENTUCKY

OWENSBORO.—The Daviess County discovery, C. E. Skiles 1 R. F. Kelly, SE SW NE 8-Q-31, is making a good McClosky well. Pay at 1,312-16 ft. was treated with acid and the well pumped 112 bbl. in the first 12 hours. After 6 days on pump the well was reported to be pumping 102 bbl. per day. The discovery is about 3 miles east of production in Nantz pool. The same operator has staked a north offset to the pool opener at 1 James Bowlds.

In northwestern Daviess County and in the area between Griffiths pool and Birk City field, Sohio Petroleum Co. and Thomas Egan 1 Gregory, 15-P-28, is cleaning out and testing the Palestine at 1,037-43 ft. The well made 20 bbl. of oil and 40 bbl. of water during the first 24 hours on pump.

INDIANA

EVANSVILLE.—In the northwestern part of Posey County and in the area between New Harmony and Springfield, George & Wrather Drilling Co., W. E. Brubeck, and George H. Pappas have a prospective Palestine well that is about ½ mile north of Springfield pool and about the same distance east of the extensions to South New Harmony pool. The well, 1-A H. F. Clements, SW SW NW 29-5s-13w, had a recovery of 60 ft. of gas, 520 ft. of clean oil, and 110 ft. of oil-cut mud on a 1-hour drill-stem test of pay at 2,012-38 ft. Operator has set casing to 2,028 ft. for further tests of the bottom part of this zone. Total depth is 2,038 ft. from an elevation of 487 ft. The same operators are starting a wildcat about ½ mile northwest of Springfield at 1 H. F. Clements, NE NE NW 33-5s-13w.

On the north edge of La Mott pool in southern Posey County, casing has been set for tests of the Tar Springs at Ashland Oil & Refining Co. et al 1 Fred Scherer, SE SE SW 12-7s-13w. A 2-hour drill-stem test at 1,956-63 ft. had a recovery of 120 ft. of oil, 75 ft. of oil-cut mud, and 60 ft. of salt water.

INDIANA WILDCAT FAILURES

Sullivan County: Eric Bock 1 Richards, NE SW SE 4-9n-9w, dry, TD 2,311 ft.

H. A. Seipman 1 U. S. Powder Co., SW NW SE 24-9n-8w, dry, TD 1,985 ft.

Vanderburgh County: J. Buchman et al 1 H. J. Hendricks, NE SE SE 20-7s-11w, dry, TD 2,584 ft.

Vigo County: J. D. Clouse and E. Ijams 1 P. and A. Nichols, NW NW SE 9-12n-9w, dry, TD 1,714 ft.

G. H. Froderman 1 Vern Watson, NE NW NE 23-10n-10w, dry, TD 2,277 ft.

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Natural Gas Producers Want Gas Act Clarified

Continued from page 60)

"The intrusion of partial federal control into the local activity of production and gathering not only disrupts the efforts of state conservation but cannot be justified on any other basis. There is no experience in our history which shows that better results could be obtained from national control instead of state control of this local activity. Producers of oil and gas have consistently expressed their preference for the exercise of regulatory powers by the states rather than by the federal Government."

Bailey pointed out that the basic philosophy of a state government is to encourage development of resources whereas the philosophy often expressed by federal regulatory agencies basically favors reservation, or withholding from use, "in the misapprehension that such policy constitutes conservation."

Oil and gas operators in many areas are confronted with the alternative of selling their gas at the risk of being brought under FPC control or, if the properties are not produced and the production marketed, face suits brought by the land and royalty owners for cancellation of leases, the subcommittee was told by R. G. Lawton of McAlester Fuel Co., Magnolia, Ark.

That situation is not confined to his company, Lawton said, but in the Southwest Texas area where it has opened three fields, there are some 57 gas fields that are not connected to gas pipe lines.

Not only is needed gas kept from consumers, he pointed out, but the producers' investment is tied up, preventing them from obtaining income which would be reinvested in the search for new oil and gas reserves, and at the same time the small independent producers' sources of financing are being dried up.

"One of the first questions that is asked today by the local banker is whether or not the property of these small independent producers is going to be subjected to a utility status by the action of the Federal Power Commission," Lawton testified. "About 60 per cent of all gas moving in interstate commerce today is produced from wells that also produce oil. If our properties are producing gas and if we are tied into interstate pipe line, our bankers are reluctant to accept such properties as collateral security for loans."

As a result of the uncertainty among the producers, many pipe lines are unable to get all the gas they need and the construction of new and additional lines is handicapped because contracts are difficult to make, Lawton said.

Lawton testified that there are between 30,000 and 40,000 independent producers in this country, who are responsible for 70 per cent of the wildcat wells drilled and produce 88 per cent of the natural gas. He was unable to tell Rep. Charles A. Wolverton of New Jersey, however, what the basic difference is between oil and gas that makes the latter a public utility while the former is not.

During the course of the testimony there was a discussion of the FPC order (No. 139) in which it said it would not take jurisdiction over independent production and gathering despite the decision in the Interstate case. Commissioner Claude L. Draper dissented from that order, on the ground that the commission was without authority to waive jurisdiction which the courts held it had, and Rep. Hale said there was no question but that Draper was correct.

Gas producers whose connections with pipe-line companies make them subject to FPC regulations have no objection to the principle of exempting production and gathering but object to the legislation under consideration because it does not extend to their operations, it was disclosed by H. R. Bennett, vice president, and E. L. Rawlins, superintendent of production engineering of Union Producing Co., Shreveport, La.

By setting up two classes of producers, the two witnesses pointed out, some land and royalty owners will be treated better than others, the sale of the same gas from the same field will be partly regulated and partly free, and one producer will be placed at a disadvantage in competing with another.

Further hearings on the legislation will be held April 25 when opponents of the exemption, including Ohio state officials who fought the Rizley bill last year, and the Federal Power Commission will be heard.

Egyptian Government

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Copies of the necessary conditions of tender, and specification can be obtained on application to The Chief Inspecting Engineer, Egyptian Government, 41, Tothill Street, London, S.W.1., against remittance of L5.2.6d. per set, which sum is not returnable. Copies of these documents are also available for scrutiny at the above address.

Secondary Recovery Is Texas Conference Topic

(Continued from page 66)

had advanced secondary-recovery methods, not only for that state but for the industry as a whole.

Dr. G. H. Fancher, of the petroleum-engineering department of University of Texas, discussed the theoretical considerations involved in secondary-recovery operations. He restricted his discussion chiefly to determination of basic criteria necessary for successful water floods and gas-injection projects. He reviewed briefly the features of various waterflooding patterns and gave a descrip-

tion of the mechanism of the processes of water flooding and gas injection.

"Gas Repressuring in Texas," was discussed by Roland Gouldy of Bridwell Oil Co., Wichita Falls, and R. F. Dobyns of the Bureau of Mines, Dallas. Their paper represented a survey of 191 such projects under way in Texas, believed to represent at least 75 per cent of all acreage and oil production affected by gas repressuring. Of the projects reported on, 178 were in North Texas. They involved 13,925 of the 34,629 acres for the state as a whole and accounted for 9,132 bbl. of the 25,623-bbl. total daily production. Four projects under way in the Texas Panhandle, involving 14,177 acres with a daily production of 12,607 bbl., accounted for much of the remaining acreage and oil production.

Minimum Expenditure

"In general," they stated, "gas repressuring has been carried on with a minimum of capital expenditure. Selection of one or more producing wells to be used as injection wells is based on available information concerning the producing section present in the proposed injection wells, location with relation to other producing wells, and amount of production loss resulting from conversion to injection duty. The resulting pattern of injection wells is seldom uniform."

Some of the more practical aspects of gas cycling were described by M. G. Miller of J. R. Butler Co., Houston, and Max Lentz of Old Ocean Oil Co., Houston, in their paper which dealt at length on the problems and economics of cycling, and on the major items which should be investigated before a project is started. But after these problems have been successfully solved there still remains that of unitization, which is necessary for a successful operation, they pointed out.

In the Thursday sessions two papers dealing with core analysis and the application of core data were read. These were "Prediction of Secondary Recovery from Core Analysis," by R. C. Earlougher and J. M. Robinson of Earlougher Engineering, Tulsa, and "Permeability Effects in Secondary Recovery," by Dr. J. C. Calhoun, Jr., chairman of the petroleum engineering school at the University of Oklahoma. "Controlling and Predetermining Secondary Recovery," was presented by W. L. Horner of Barnsdall Oil Co., Tulsa; and "Research on a Method of Determination of Water Flood by Electrical Resistivity Methods" was given by H. G. Vanhorn and R. S. Guenther of A. & M. College. At the banquet given Thursday night Paul Weaver of Gulf Oil Corp., Houston, was the principal speaker. He spoke on "A New Field of Public Service for the Petroleum Engineer."

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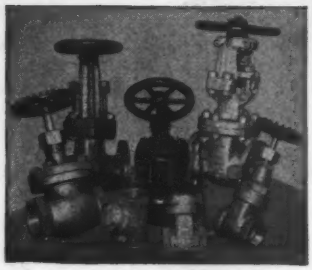

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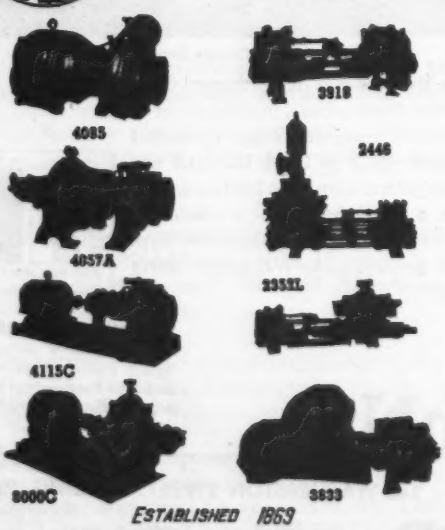

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NATURAL GAS

Northern Natural Wants to Increase Line Capacity

Northern Natural Gas Co., Omaha, is seeking authorization from Federal Power Commission to construct and operate natural-gas facilities which would increase capacity of the firm's system north of Kansas by 60,000,000 cu. ft. of gas daily, at an estimated cost of $27,800,000.

The firm proposes to construct a total of approximately 327 miles of line in Kansas, Nebraska, and Iowa; to install 10 compressor units with an aggregate horsepower of 16,000; and to build a dehydration plant at Garden City, Kans.

Northern Natural claims the additional capacity is needed to meet increasing demands for gas. The system's capacity is now 425,000,000 cu. ft. daily north of Kansas. Facilities recently authorized by FPC will increase this to 470,000,000 cu. ft. late this year. In the present application, Northern Natural is asking FPC authorization for a further increase to 530,000,000 cu. ft. in order to meet its needs in the 1950-51 heating season.

Application states the company proposes to raise funds for the proposed new construction either through sale of debentures or through bank loans, or by a combination of both. The firm transports gas from Panhandle field in Texas, and Hugoton field in Kansas, to markets in Texas, Oklahoma, Kansas, Nebraska, Iowa, Minnesota, and South Dakota.

Indianapolis Seeks Permit To Build Natural-Gas Line

The City of Indianapolis has asked Federal Power Commission for authority to construct and operate a 55-mile 16-in. natural-gas pipe line extending from Texas Eastern Transmission Corp.'s line in Indiana, to the city's plant in Indianapolis, at an estimated cost of $2,400,000.

Request for FPC authorization was submitted as an amendment to the city's previous application, filed last July, in which it requested a commission order directing either Texas Eastern or Panhandle Eastern Pipe Line Co. to permit the city to establish connection with one of the two companies' systems. The July application also proposed that FPC require delivery or sale of 10,000,000 cu. ft. of gas daily to Indianapolis by one or more of the following companies: Texas Eastern, Panhandle, Texas Gas Transmission Corp., and Tennessee Gas Transmission Co.

Hearing on this application was held in Washington in March, and is now recessed pending further commission order.

In its amendment to the application, Indianapolis said it would finance construction cost of the facilities from its own funds. Proposed line would have a capacity of approximately 50,000,000 cu. ft. of gas daily, the city said.

Southern California Gas Sponsors P.C.G.A. Meeting

Southern California Gas Co., sponsor of the April 28-29 meeting of the technical section of Pacific Coast Gas Association, has completed the group's program, and has announced that all sessions will be held in the company's auditorium in Los Angeles. The complete program follows:

April 28: "Pipe Threads and Pipe-Thread Dopes," by C. E. Lee, Southern California Gas Co.; "Personnel Aspects of Technical Service," R. I. Snyder, Southern California Gas Co.; "Testing and Evaluation of Underground-Pipe Coatings," a symposium, led by S. K. Gally, Southern California Gas Co.; "Evaluation of the Bonding Strength Developed With Pipe Primers and Coating Materials," by K. F. Williamson, San Diego Gas & Electric Co.; "Use and Abuse of Jump-Spark 'Holiday' Detectors," by T. H. Gilbert, Southern California Gas Co.; "Influence of Fillers on Performance of Asphalt-Enamel Pipe Coatings," an open discussion.

April 29: "Experiences With Odor and Odorization of Mid-Continent Natural Gas," by J. S. Powell, Southern California Gas Co.; "Deposits Formed in Pilot-Light Assemblies in Natural-Gas Service," by H. O. Kruger, Southern California Gas Co.; "Analytical Recorder for Nature and Amount of Impurities in Fuel Gas," by L. J. Willien, San Diego Gas & Electric Co.; "Interchangeability of L.P.G.-Air Mixtures With Natural Gas," a symposium led by Paul Mong, Pacific Gas & Electric Co.

FPC Dismisses Old Border Pipe Line Co. Application

Federal Power Commission has dismissed for want of jurisdiction, a 1942 application of Border Pipe Line Co. for authorization to construct and operate natural-gas facilities, subsequently completed, which carry gas to a point near the international boundary in Texas, for exportation to Mexico.

In its application, Border proposed to construct a compressor station and a 38-mile line located entirely in Texas, to transport gas for resale to American Smelting & Refining Co., which in turn would transport the gas to Mexico for use at a zinc smelter owned by the latter company.

Later in 1942 the commission issued an order in a companion proceeding authorizing Border to export gas from the country to Mexico. A presidential permit authorizing construction, operation, maintenance, and connection of facilities at the border also was issued. Border Pipe Line then proceeded to construct both the facilities authorized by the presidential permit, and those proposed in its application. The line was completed, and operations had commenced by June 1943.

In 1947 FPC adopted an order in which it was determined that Border's construction and operation of the facilities made it subject to FPC jurisdiction under the Natural Gas Act. The firm subsequently filed a petition in the U. S. Court of Appeals for the District of Columbia, for a review of this order. The court in November 1948 ruled that the company is not a "natural-gas company" within the meaning of the act, and not subject to FPC jurisdiction, and therefore directed that the commission's order be set aside.

A.G.A. Natural-Gas Section Meets in French Lick May 9

Plans are being completed for the annual spring meeting of the natural-gas department, American Gas Association, which will be held in French Lick, Ind., May 9-10. More than 600 reservations have been received at headquarters at the French Lick Springs Hotel, and it is expected that an all-time record in attendance will be set.

Chairman E. F. Schmidt, Lone Star Gas Co., Dallas, has arranged two general sessions, during which topics of interest to the industry will be discussed. Question of unification of the gas industry will be broached by Robert W. Hendee, president of Colorado Interstate Gas Co., and of the association.

Included in topics for discussion will be "Natural-Gas Problems in the Territory of Greatest Reserves," by William J. Murray, Jr., chairman, Texas Railroad Commission, and "Recent Legal, Regulatory, and Legislative Events Affecting the Natural-Gas Industry," by Glenn W. Clark, vice president, and general counsel, Cities Service Gas Co., of Oklahoma City.

Also slated on the agenda during the 2-day meeting are the following papers: "Catalytic Reforming and Thermal Cracking," by Edwin L. Hall, director of A.G.A. testing laboratories in Cleveland; "Storage of Gas to Meet Peak Loads," and "Economics of Underground Reservoirs," by Max W. Ball, former director of the oil and gas division, U. S. Department of the Interior; "Pipe Batteries," by F. A. Hough, vice president, Southern Counties Gas Co. of California; and "Propane," by A. B. Lauderbaugh, chief gas engineer, Manufacturers Light & Heat Co., Pittsburgh.

STATISTICS and

WEEKLY WELL COMPLETIONS . . . . WEEK ENDED APRIL 9, 1949

	Total of all wells					14 wk.		Wildcat completions and discoveries					Cumulative total, 1949				
	Comp.	Oil	Gas	Dry	Footage	1949	1948	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	27	14	0	*13	29,003	326	393	0	0	0	0	0	0	0	0	0	0
Pennsylvania	39	18	4	†17	58,620	481	723	0	0	0	0	0	0	0	1	1	2
West Virginia	13	0	11	2	43,470	140	201	0	0	0	2	2	0	0	4	4	8
Ohio	21	5	4	12	37,218	294	313	0	0	0	1	1	1	0	1	13	15
Indiana	25	13	0	12	49,286	273	238	0	0	0	5	5	3	0	0	59	62
Kentucky	19	5	6	8	37,567	219	151	0	0	0	0	0	2	0	0	12	14
Illinois	28	18	0	10	66,571	513	466	0	0	0	4	4	8	0	0	83	91
Michigan	20	3	0	17	47,201	238	155	3	0	0	5	8	11	0	1	87	99
Kansas	65	34	3	28	220,371	741	646	1	0	0	7	8	13	0	2	96	111
Neb., Mo., Iowa	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
Oklahoma	108	58	8	42	389,468	975	934	4	0	0	17	21	39	6	5	142	192
Texas	242	140	17	85	1,125,953	3,343	2,724	6	2	5	39	52	113	10	29	566	718
North Central (Dist. 7-B & 9)	82	38	3	‡41	226,598	1,076	806	3	0	3	13	19	61	0	5	210	276
West (Dist. 7-C & 8)	50	42	0	8	318,725	733	736	0	0	0	6	6	12	0	0	47	59
Panhandle (Dist. 10)	10	6	3	1	31,105	278	141	0	0	0	1	1	0	0	0	1	1
Eastern (Dist. 5 & 6)	13	6	3	4	79,755	180	140	0	0	0	2	2	1	1	2	28	32
Gulf Coast (Dist. 2 & 3)	37	24	6	7	244,378	496	435	3	1	1	5	10	22	5	14	109	150
Southwest (Dist. 1 & 4)	50	24	2	24	231,392	580	466	0	1	1	12	14	17	4	8	171	200
Louisiana	37	24	1	12	226,301	532	426	3	1	0	8	12	12	4	0	49	65
Northern	20	14	1	5	83,090	274	264	1	0	0	4	5	1	0	0	24	25
Southern	17	10	0	7	143,211	258	162	2	1	0	4	7	11	4	0	25	40
Arkansas	3	3	0	0	13,284	63	70	0	0	0	0	0	1	0	0	17	18
Mississippi	9	5	0	‡4	65,358	94	100	0	0	0	1	1	2	0	1	25	28
Southeastern States	1	0	0	1	4,514	15	12	0	0	0	1	1	1	0	0	13	14
Montana	5	4	0	1	20,848	49	57	0	0	0	0	0	1	0	1	5	7
Wyoming	8	6	0	2	49,324	140	101	1	0	0	1	2	6	0	0	25	31
Colorado-Utah	2	1	0	1	14,938	33	71	0	0	0	1	1	1	0	0	11	12
New Mexico	11	6	2	3	58,196	142	156	0	0	0	1	1	2	0	0	12	14
California	43	36	0	7	168,930	701	709	2	0	0	7	9	15	0	2	123	140
Total United States	726	393	56	277	2,726,421	9,313	8,646	20	3	5	100	128	231	20	47	1,344	1,642
Total previous week	684	392	35	257	2,396,354	8,587	8,025	12	1	7	105	125	211	17	42	1,244	1,514
Total April 10, 1948	621	337	47	237	2,132,120			8	0	7	82	97	176	17	72	1,192	1,457

Service wells included: *13, †17, ‡1.

CRUDE PRICES AND REFINERY ACTIVITY

GRAVITY SCHEDULE

Gravity—	Signal Hill, Calif.	Okla-homa, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.96	....	....	....
19-19.9	2.07	....	....	....
20-20.9	2.17	$2.25	....	$2.12
21-21.9	2.23	2.27	....	2.14
22-22.9	2.27	2.29	....	2.16
23-23.9	2.30	2.31	....	2.18
24-24.9	2.34	2.33	$2.56	2.20
25-25.9	2.38	2.35	2.58	2.22
26-26.9	2.41	2.37	2.60	2.24
27-27.9	2.45	2.39	2.62	2.26
28-28.9	2.49	2.41	2.64	2.28
29-29.9	2.52	2.43	2.66	2.30
30-30.9	2.56	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.62	2.49	2.72	2.36
33-33.9	....	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above	....	2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point. †Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. (For detailed price changes in all fields see The Oil and Gas Journal, January 1, 1948, page 107.)

A.P.I. REFINERY REPORT, WEEK ENDED APRIL 2

(Thousands of barrels)

District—	Crude runs, daily avg.	Production: Gasoline†	Kerosine	Gas & dist. oil	Residual	Stocks at refineries, bulk terminals, in transit and in pipe lines: Gasoline*	Kerosine	Gas & dist. oil	Residual
East Coast	750	2,104	190	1,123	1,395	28,145	7,578	16,563	9,924
Appalachian:									
District 1	86	288	31	73	82	2,760	390	649	446
District 2	73	256	26	58	119	1,305	160	227	273
Ind., Ill., Ky.	883	3,445	408	949	1,048	29,119	2,667	7,108	4,722
Okla., Kans., Mo.	407	1,526	139	526	517	13,485	753	2,914	2,152
Inland Texas	207	972	74	176	343	5,205	411	640	1,058
Texas Gulf Coast	1,287	4,243	576	1,677	1,649	19,856	2,667	8,735	9,102
La. Gulf Coast	442	1,414	352	594	448	5,724	2,028	2,671	2,229
N. La. and Ark.	87	182	44	83	123	2,312	382	975	199
Rocky Mountain:									
New Mexico	13	49	..	10	26	82	25	33	40
Other Rocky Mtn.	173	506	34	228	267	3,937	191	1,140	726
California	881	2,650	85	1,161	2,334	15,839	663	6,901	27,839
April 2, 1949‡	5,269	17,635	1,959	6,658	8,351	127,769	17,915	48,556	58,710
March 26, 1949‡	5,353	17,417	2,014	6,167	8,305	128,087	17,700	48,721	58,792

*Finished and unfinished. †At refineries including natural blended. ‡Data for 1948 on new basis not yet available.

Bureau of Mines crude-oil stocks 267,751,000 bbl. as of April 2—up 1,245,000 bbl. One year ago 229,678,000 bbl.

FLAT CRUDE PRICES

Representative posted schedules per bbl.

East Texas†	$2.65
Kettleman Hills, California*	2.64
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	3.55
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above.

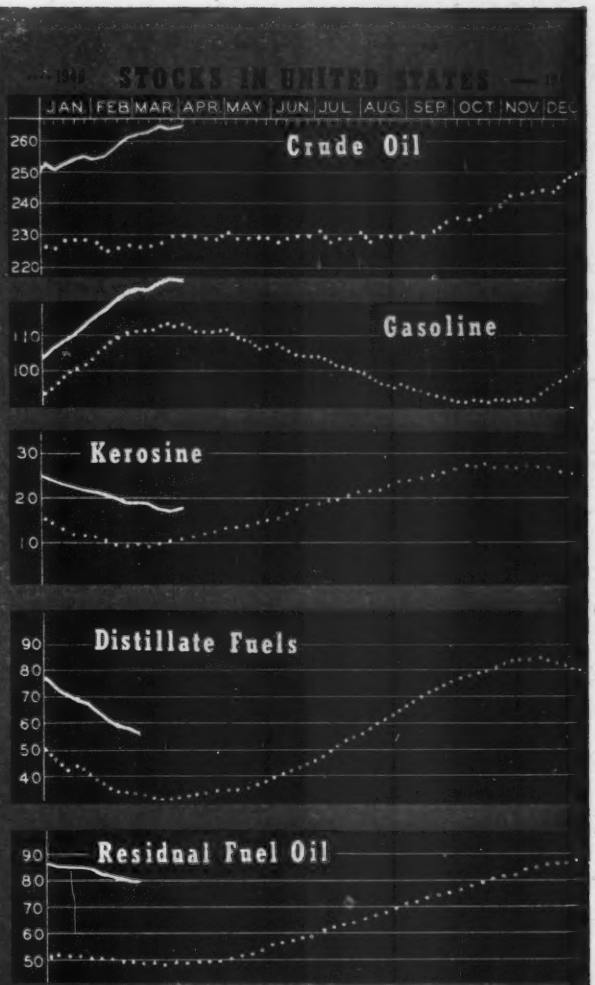
TRENDS

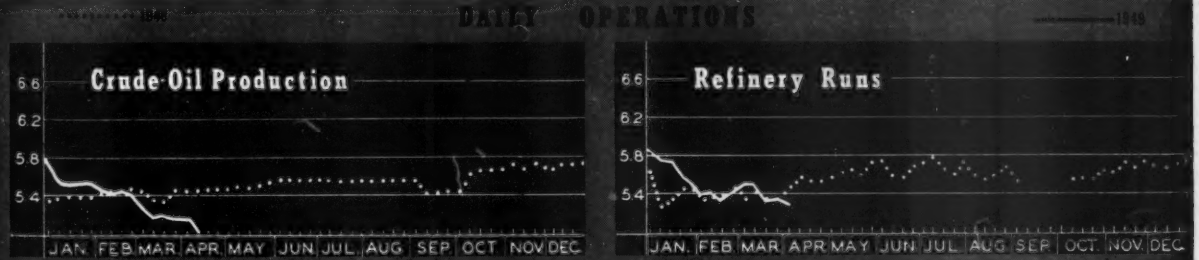
DAILY AVERAGE PRODUCTION FOR WEEK

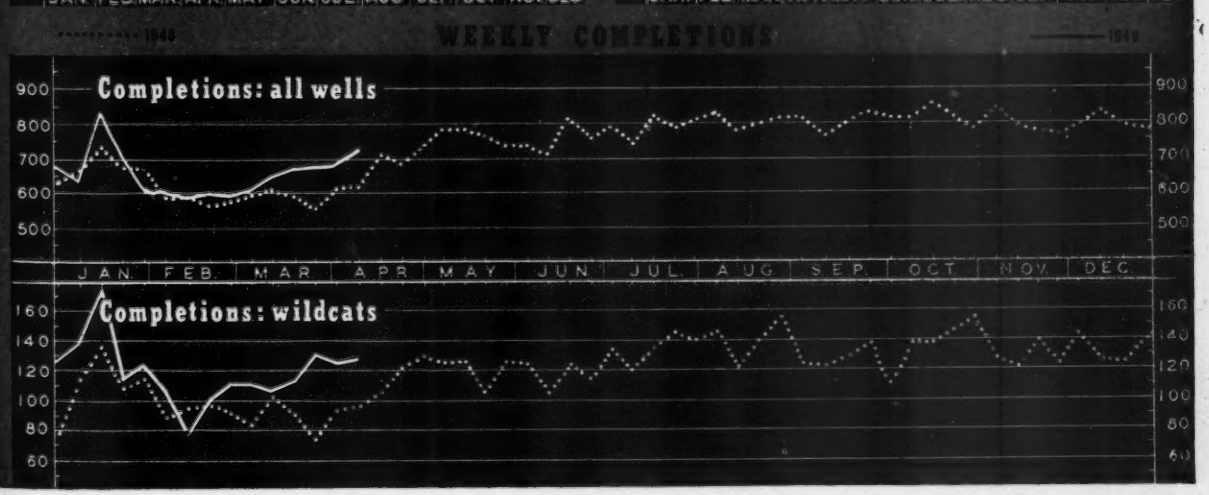
	April 9 crude oil	B. of M. Mar. demand	April 2 crude oil
Alabama	1,300	1,700	1,200
Arkansas	81,500	84,000	80,100
California	949,300	950,000	950,200
Colorado	*61,600	53,000	61,400
Eastern	62,250	62,300	60,250
Florida	1,475	1,300	1,575
Illinois	180,300	167,000	174,200
Indiana	26,300	22,000	22,000
Kansas	284,100	290,000	296,750
Kentucky	23,900	22,000	23,600
Louisiana	495,450	475,000	490,050
North Louisiana	118,450	.....	116,700
South Louisiana	377,000	.....	373,350
Michigan	44,650	45,000	44,100
Mississippi	106,900	125,000	106,850
Montana	25,800	24,000	25,600
Nebraska	300	700	300
New Mexico	131,800	125,000	135,025
Oklahoma	398,200	412,000	398,750
Texas	1,911,300	2,400,000	2,066,025
Dist. 1 (Southwest)	25,210	.....	26,325
Dist. 2 (Southwest)	120,950	.....	134,150
Dist. 4 (Southwest)	185,250	.....	198,950
Dist. 3 (Gulf Coast)	363,115	.....	395,150
Dist. 5 (Eastern)	35,575	.....	40,200
Dist. 6 (Eastern)	84,550	.....	93,825
East Texas Field	253,600	.....	267,450
Dist. 7-C (West)	42,525	.....	45,750
Dist. 8 (West)	535,725	.....	593,000
Dist. 7-B (W. Central)	58,600	.....	60,100
Dist. 9 (N. Central)	118,500	.....	123,850
Dist. 10 (Panhandle)	87,700	.....	87,275
Wyoming	125,500	140,000	*30,100
Total United States	†4,911,925	5,400,000	5,068,075
Change from prev. wk., dn.	156,150		

Total production January 1-April 9..... ‡529,504,910 bbl.
Same period last year (crude plus cond.).. 540,768,010 bbl.

*Incl. 200 bbl. Utah production. †Not incl. 88,375 bbl condensate. ‡Incl. 8,382,755 bbl. condensate.







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MARKETS

MARKETS for the week were highlighted by increases in the movement of gasoline and still further declines by light fuels.

Most suppliers feel that summer demands for gasoline will set new records, with estimates of increases over last season running from as low as 3 per cent up to 7 per cent. Total demand for gasoline in January was 5.6 per cent greater than in January of last year, but a large part of the increase came from a gain in exports. Domestic demand was up 3.2 per cent, but refinery production of gasoline was about 9 per cent above the same period last year. With the number of cars on the road this year exceeding that of last year by an expected 8 per cent, the next 6 months should bring peak gasoline demands.

The general increase of ½ cent in the price of gasoline on the Gulf Coast followed by the East Coast rise has brought some comment about a possible increase in postings in the Mid-Continent area. Reported shipments have risen steadily for the past few weeks with larger gains expected in the near future. At least two suppliers said that they did not think any important part of the increased movement is going toward refilling excessively depleted jobber storage, but that increased shipments represent actual increases in demand. While plenty of gasoline is available, the tendency toward volume movement at very low prices seems to have disappeared. Some suppliers think that the gasoline in their tanks will bring a better price next month than it will if sold this week.

Movement of distillate fuels from the Mid-Continent continued very slow, but reported sales indicate that distributors are having to make purchases to supply consumer demand near the end of the heating season. In normal seasons, most of these final sales for home heating can be made from distributors' stocks but current sales seem to indicate that secondary inventories are very low. If these inventories are very low, it will mean a better-than-average movement of heating oils as soon as the stocking season starts. At the present, however, the bright spot in the general distillate market is the increase in inquiries about diesel fuels. This part of the distillate cut is expected to move much better than last year.

Gulf Coast Gasoline Moves

Strength in the Gulf Coast petroleum-products spot market continued to center in gasoline. An appreciable increase in demand was noted as more gasoline shipping orders were reported by suppliers. All other materials were reported as showing little evidence of strengthening, and light burning oils as being particularly weak. No. 2 and No. 6 were "hardly moving at all," according to one supplier.

Seasonal Trend in New York

Falling light-distillate prices and rising quotations for motor fuel characterized the products market in the New York-New England area last week. These movements followed the normal prewar seasonal pattern, but the current continued downturn in light heating oils marks a particularly sharp end-of-season slump.

Several other major marketing companies followed the lead of Socony-Vacuum Oil Co., Inc., in announcing increases in gasoline prices. Esso Standard Oil Co.'s basic price structure went up ½ cent, effective April 6. Atlantic Refining Co. and Sun Oil Co. also met the increases in New York and New England.

Spot-market prices for light heating oils drifted fractionally lower. At the barge level in New York Harbor, low prices for No. 2 went to 7.3 cents.

Representative Quotations

Representative spot-market quotations of leading suppliers as of April 11, 1949. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Texas Gulf Coast
Regular gasoline, 73-75 octane	9⅛-9½	11.5	9¼-10
Premium gasoline, 78-80 octane	9⅞-10½	12.5	10¼-11
42-44 w.w. kerosine	8-8½	8.875-9.2	8¼-8¾
No. 2 straw fuel oil	7¼-7⅛	7.3-8	6¾-7¼
No. 6 residual	$1.00-1.10	$1.75-1.85	$1.35-1.45

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	5	4½	4¾
Grade 18-55	6	5.4	5.7

LUBRICATING OILS
South Texas

200 vis., No. 2-3 neutral	11-13.5
750 vis., No. 3-4 neutral	14-16.5
2,000 No. 5-6 neutral	16-18.5

LUBRICATING OILS
Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	20
200 vis., No. 3 neutral, 0-10 pp.	14

Western Pennsylvania

144-155 vis. 10 p.t. bright stock	23.5
180 vis., 0 p.t. neutral	22.5-25.5

CRUDE-SCALE WAX
Mid-Continent

132-134 A.M.P.	5

EQUIPMENT MEN ... in the News

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APPROXIMATELY
100
SUPPLY
COMPANIES
Operating More
Than 770 STORES

SELL
HERCULES
PRODUCTS

You will find Hercules Pumping Well Equipment, Tubing Heads, Casing Heads and Tubing Spiders at YOUR FAVORITE SUPPLY STORE.

Your Guarantee of Satisfaction . . . Ask for them by Name.

HERCULES TOOL TULSA

SOLD AT ALL SUPPLY STORES

HERCULES
TOOL COMPANY
Manufacturers of Oil Field Equipment
General Office and Plant:
17th and Phoenix
P. O. Box 286, Tulsa 1, Oklahoma
Cable Address "HERTOCO"
Telephone 3-1186

MARKETS

MARKETS for the week were highlighted by increases in the movement of gasoline and still further declines by light fuels.

Most suppliers feel that summer demands for gasoline will set new records, with estimates of increases over last season running from as low as 3 per cent up to 7 per cent. Total demand for gasoline in January was 5.6 per cent greater than in January of last year, but a large part of the increase came from a gain in exports. Domestic demand was up 3.2 per cent, but refinery production of gasoline was about 9 per cent above the same period last year. With the number of cars on the road this year exceeding that of last year by an expected 8 per cent, the next 6 months should bring peak gasoline demands.

The general increase of ½ cent in the price of gasoline on the Gulf Coast followed by the East Coast rise has brought some comment about a possible increase in postings in the Mid-Continent area. Reported shipments have risen steadily for the past few weeks with larger gains expected in the near future. At least two suppliers said that they did not think any important part of the increased movement is going toward refilling excessively depleted jobber storage, but that increased shipments represent actual increases in demand. While plenty of gasoline is available, the tendency toward volume movement at very low prices seems to have disappeared. Some suppliers think that the gasoline in their tanks will bring a better price next month than it will if sold this week.

Movement of distillate fuels from the Mid-Continent continued very slow, but reported sales indicate that distributors are having to make purchases to supply consumer demand near the end of the heating season. In normal seasons, most of these final sales for home heating can be made from distributors' stocks but current sales seem to indicate that secondary inventories are very low. If these inventories are very low, it will mean a better-than-average movement of heating oils as soon as the stocking season starts. At the present, however, the bright spot in the general distillate market is the increase in inquiries about diesel fuels. This part of the distillate cut is expected to move much better than last year.

Gulf Coast Gasoline Moves

Strength in the Gulf Coast petroleum-products spot market continued to center in gasoline. An appreciable increase in demand was noted as more gasoline shipping orders were reported by suppliers. All other materials were reported as showing little evidence of strengthening, and light burning oils as being particularly weak. No. 2 and No. 6 were "hardly moving at all," according to one supplier.

Seasonal Trend in New York

Falling light-distillate prices and rising quotations for motor fuel characterized the products market in the New York-New England area last week. These movements followed the normal prewar seasonal pattern, but the current continued downturn in light heating oils marks a particularly sharp end-of-season slump.

Several other major marketing companies followed the lead of Socony-Vacuum Oil Co., Inc., in announcing increases in gasoline prices. Esso Standard Oil Co.'s basic price structure went up ½ cent, effective April 6. Atlantic Refining Co. and Sun Oil Co. also met the increases in New York and New England.

Spot-market prices for light heating oils drifted fractionally lower. At the barge level in New York Harbor, low prices for No. 2 went to 7.3 cents.

Representative Quotations

Representative spot-market quotations of leading suppliers as of April 11, 1949. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Texas Gulf Coast
Regular gasoline, 73-75 octane	9⅛-9½	11.5	9¼-10
Premium gasoline, 78-80 octane	9⅞-10½	12.5	10¼-11
42-44 w.w. kerosine	8-8½	8.875-9.2	8¼-8¾
No. 2 straw fuel oil	7¼-7½	7.3-8	6¾-7¼
No. 6 residual	$1.00-1.10	$1.75-1.85	$1.35-1.45

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	5	4½	4¾
Grade 18-55	6	5.4	5.7

LUBRICATING OILS
South Texas

200 vis., No. 2-3 neutral	11-13.5
750 vis., No. 3-4 neutral	14-16.5
2,000 No. 5-6 neutral	16-18.5

LUBRICATING OILS
Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	2
200 vis., No. 3 neutral, 0-10 pp.	1

Western Pennsylvania

144-155 vis. 10 p.t. bright stock	23.5
180 vis., 0 p.t. neutral	22.5-25.5

CRUDE-SCALE WAX
Mid-Continent

132-134 A.M.P.	

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Classified Advertising

The Market Place for the Oil Industry

UNDISPLAYED

All ads, 12 cents a word. Minimum charge, $3.00 per insertion.
Centered Line, any ad, $1.00.
Box Numbers count 9 words when replies are to be sent to our Tulsa Office. Replies forwarded without charge.

DISPLAYED, PER INCH

$12.00 per column inch per insertion. One-point border and 12-point capitals are allowed. Larger type sizes not accepted.

All classified advertising payable in advance.
10% Discount if 3 insertions are ordered at one time.
COPY DEADLINE, 9:00 a.m. Monday prior to each week's issue.

THE OIL AND GAS JOURNAL
P. O. Box 1260, TULSA, OKLAHOMA

EQUIPMENT FOR SALE

FOR SALE: Lubricating Oil Canning Equipment, 1 Six-pocket Sprague-Sells Quart Can Filler, 1 Standard Knapp Booster Elevator and Boxer, 1 Empty Can Feeder and Motor, Good condition, taken out of service January 1, 1949. Located at Cyril, Oklahoma. As is, where is, $2,500.00. Anderson-Prichard Oil Corporation, 1000 Apco Tower, Oklahoma City 2, Oklahoma.

FOR SALE: 1 Double Drum Cardwell Spudder, 145 H.P. Waukesha Motor, rotary attachment, complete with tools, wire lines, doghouse, Kohler Light plant, steel derrick, ready to go. Priced to sell. Fox Well Servicing Co., Box 488, Healdton, Okla.

PACKAGED H_2S REMOVAL UNITS

We offer prompt shipment on skid-mounted hydrogen sulfide removal units for treating sour gas for pipe line or fuel gas purposes.

GRAFF ENGINEERING & EQ'PT. CO.
3415 Westminster, Dallas 5, Texas

EQUIPMENT FOR SALE

FOR SALE: Model "K" Cardwell, single drum draw works powered by G.A.K. Waukesha engine. Equipped with 98' "A" mast and sub skid. Priced for quick sale. Terms. Melton Supply Co., Seminole, Okla.

FOR SALE—Cardwell Draw Works, Model "L"—Air Clutches—A-1 Condition. Box 3246, Corpus Christi, Texas.

FOR SALE: Wilson Giant draw works, powered by 2—J.L.-1335 Buda engines and Wilson chain compound. Like new condition, with bargain price. Terms. Melton Supply Co., Seminole, Okla.

DRILLING IN Units—2 Complete Beam Type Units with A frame masts and 5" Tools. One with WOK Waukesha; other has D 13000 Caterpillar. Beardmore Drilling Company, 603 Petroleum Bldg., Wichita, Kansas.

PIPE MACHINE FOR SALE
One Bignall Keeler motor driven Pipe Machine in good condition. Threads pipe from 2" to 6". Dies included up to 6". Oil Field Salvage Company, Box 1362, Odessa, Texas.

WELL drilling spudders, beams, light rotaries, core drills, tools, casing. Used equipment at money saving prices. Spang and Mills new tools. Leschen lines. Everything for well drilling. Pressey & Son, Pueblo, Colo.

PARTS FOR ARMY TRUCKS

New and Used

Largest stock in America, 6x8, 6x4, 4x4, 4x2. All items guaranteed. Largest auto wrecking house in the west with most complete stock of new and reconditioned parts for all cars and trucks. New jeep power units complete with radiators and stub shafts. Fast service.

PIONEER AUTO WRECKING CO.
732 W. 13th Ave. Denver 17, Colo.

EQUIPMENT FOR SALE

STEEL

For All Purposes

Immediate Delivery

East and West Coast Warehouses

Write — Phone — Wire

LONG ISLAND BEAM CO.
39-21 21st St. Long Island City 1, N. Y.
Stillwell 6-5900-1-2

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

SAVE WITH SAFETY—Very Good Used Wire Line—Any Size or Length up to 5,000 —Respooled for Your Inspection — Cable Tools For Sale. General Tool & Supply Co. P.O. Box 4387, Phone 61335, Oklahoma City Okla.

FOR SALE: Priced to sell, 1—37,500-bbl riveted steel Tank with floating Roof, 8—2,000-Gal. gasoline Tanks mounted on Semi-trailers, 10—10x35 gasoline Tank riveted. Write Independent Tank Co., Box 102, Seminole, Okla.

SHOT HOLE drill, on 1941 Ford truck. Hyd. lift mast, chain pull down, 3" kelly, 4½ x 6 G.D. pump, twin disc clutches. Waters Drilling Service, 69 Beacon Place, Pasadena 8, Calif.

FOR SALE: Double drum heavy duty spudder, 6500 foot capacity, with telescoping mast with roller bearing sheaves, all mounted on steel skid. All tools for 7" and 5" casing, Kohler light plant, unitized forge on skid, large skid rack for moving all tools. Machine and tools in excellent shape. Everything rigged for quick moving. Ready to put to work. Price $12,500.00. Box C-857, The Oil and Gas Journal, Tulsa, Oklahoma.

USED OIL FIELD ENGINES, POWERS, Tanks, Casing, Rods, Shackle Irons. A. K. Cline, Phone 664, 501 Peoples Bank Bldg. Marietta, Ohio.

FOR SALE: One Sullivan Core Drill equipped for water well drilling. Paul Hardy, 800 Camino de las Marquez, Santa Fe, New Mexico, Phone 3368-J.

1—140 CLEVELAND Ditcher with 22" Buckets, 1 Extra set stripping buckets, 1 TD-9 Side Boom, 1 Cleaning Machine with spare change over parts and dollies, 1 Pipe finder, 1 Generator, 1 Beveling machine, 1 Power pipe straightener, 1 10-Barrel Heating Kettle, 2 International Trucks and other miscellaneous equipment. McCall & Sebastian, Phone 290, Drumright, Oklahoma.

FOR SALE

12—230 H.P. Type 10 Bessemer New 17" Power Cylinders complete ready to run with 16" to 18" Compressors. 1—230 H.P. Clark Horizontal with Compressors. Located Salem, Illinois.

ENGLE PETROLEUM, Incorporated
Box 655, Evansville, Indiana

FOR SALE

1947 Beechcraft Bonanza, good condition, 550 hours on plane and motor. Has in addition to regular equipment, an A. D. F. radio, gyro compass, attitude gyro, 3 three-minute flares, seat covers and a plastic propeller. Will trade for petroleum products or sell for cash.

Box C-840

The Oil and Gas Journal
Tulsa, Oklahoma

New **CENTRIFUGAL PUMP UNITS**

For Water, Crude and Petroleum Products

HIGHLY PORTABLE—EXTREMELY FLEXIBLE

PRICED AT LESS THAN HALF OF REGULAR COST

BYRON JACKSON "PUP" 2-stage Multiplex Centrifugal Pump direct connected to **CHRYSLER** Model 36 (Ind. 9) 8-cylinder Gasoline Engine, Mounted on rugged oil field type skid with necessary gauges and controls.

Designed for a wide range of operating conditions, this unit is particularly adapted to "pick-up" service in the oil fields, or other services where large variance in head and capacity are desirable.

Units are guaranteed to be in factory-new condition. Regular production models pump and engine. Parts readily available. Inquire for prices and specifications.

LUCEY PRODUCTS CORPORATION
OIL WELL SUPPLIES
TULSA, OKLAHOMA

EQUIPMENT FOR SALE

,000 FEET 2½" threaded and coupled ck line pipe excellent condition twenty et random lengths, reasonable price. K. W. rter Box 598, Effingham, Ill. Phone 207.

FOR SALE: Bucyrus-Erie 36L Spudder th A-Frame mast, air brakes, special e, tires, fifth wheel, complete. Used on clean-out job only, and is same as brand w. Located near Pittsburgh, Penna. Write oducer, 43 Grant Avenue, Pittsburgh 23, nna., or phone STerling 4600.

FOR SALE: Complete set of rod and bing tools for ⅝, ¾ & ⅞ rods and 2" d 2½ regular and upset tubing as well many other miscellaneous tools. Price 0.00. Electrodrill Corporation, Box 1220, rtlesvile, Oklahoma. Telephone 774.

15,000′ of 4" O.D. 6-lb. seamless line, cut 35 ft. lengths. No. 1 condition. Price: per foot. M. J. Regan, Coffeyville, Kan-s.

COMPLETELY reconditioned 6 cylinder x 8½ Atlas Imperial Diesel Engine $8500. outhwest Drilling Co., 209 Petroleum Bldg., rt Worth. Telephone 2-9291.

FOR SALE: Threading Machine, Biglow-eeler with Landis head, cuts from 6" to direct drive, several sets of dies. No. 1 ndition. Machine now in operation. Price: 000. M. J. Regan, Coffeyville, Kansas.

FOR SALE: 8000′ 16" O.D. 42 lb. plain end e, all sizes casing and line. Inquire: Rog-s Pipe & Supply Co., 221 Wright Bldg., hone 3-2072, Tulsa, Oklahoma.

ROTARY Drilling Mast 96′ steel angle on. Substructure, raising device, foible oard, guy lines, complete. Price $2,500.00. Iowa Drilling Company, Inc., 717 Union ational Bank Building, Wichita 2, Kansas. hone 3-8013.

NEW CENTRIFUGAL PUMPS

Byron Jackson—Aurora—Lombard—Gould -Hale — Gorman Rupp — Wayne & Novo, mplete with engine power, also 1½ to KW light plants. H. A. McCarthy, 310 hompson Building, Tulsa, Oklahoma.

MANUFACTURERS LATEST DESIGN

Hydraulic Casing Pulling Units. Complete line of equipment. Units made to your specifications. Truck Mountings or Skid Units. Repair Service and Parts.

OKLAHOMA MACHINE & SUPPLY CO.
Ada, Oklahoma

FOR SALE

DIESELS AND PUMPS

3—New unused 475 BHP 5 cylinder Baldwin Model VG Diesel Engines, one connected to Ingersoll-Rand Multi-stage Centrifugal Pump with Farrell-Birmingham Step-up Gear and two connected to Worthington Horizontal Triplex Double Acting Pumps, all units complete with Falk couplings, Lummus Coolers, other accessories. Location Ohio, immediate shipment. Direct inquiries to

THE BUCKEYE PIPE LINE COMPANY
Joseph Steele, Purchasing Agent, Room 2200, 30 Broad St., New York 4, N. Y.

FOR SALE

NEW CASING AND LINE PIPE

25,000′ 5½" 15½# 8RT J55 R2 API Smls. Casing
15,000′ 7" 23# 8RT J55 R2 API Smls. Casing
6,000′ 8⅝" 28# 8RT J55 R2 API Smls. Casing
4,641′ 9⅝" 36# 8RT J55 R2 API Smls. Casing
7,015′ 10¾" 40½# 8RT J55 R2 API Smls. Casing
19,000′ (893 Joints) 6" Std. Byer's Wrought Iron L.W. Plain End Pipe (ASTM A72-33)

Above subject to prior sale.

THE NATIONAL COOPERATIVE REFINERY ASSOCIATION
P.O. Box 770 McPherson, Kansas
Phone 820

EQUIPMENT FOR SALE

FOR SALE: 1 Model K Cardwell Double Drum Draw Works with rotary table drive and transmission assembly, American cathead. 2 D13,000 Caterpillar engines. 1 Type FE 12½" National Rotary Table. 1 3½" Kelly. 2 3½" Drill Collars. Misc. 3½" Drill pipe slips, Kelly bushings, and drill pipe subs, all in first-class condition, located our McPherson, Kansas, yard. Veeder Supply & Development Co., Cherryvale, Kansas.

FOR SALE: At our Lacy Gasoline Plant, Section 14-8-6, Seminole County, four 4-Room houses to be moved. $2,000.00 each. Contact G. F. Downs at plant or write Cities Service Oil Co., Patridge, Bartlesville, Okla.

FOR SALE: Practically new Hydraulic Casing Pulling machine.

THE ACME COMPANY
BOX 1358 Phone 1423
SEMINOLE, OKLAHOMA

FOR SALE: Mush Creek area, New Castle, Wyoming: One new 36 L Bucyrus Erie cable tool rig and one used 36 L Bucyrus Erie cable tool rig. Capitol Oil and Gas Corp., 414 Majestic Bldg., Cheyenne, Wyoming, or Jack Bradley, Phone 179-W, New Castle, Wyoming.

STEEL STORAGE TANKS: 1—1500 Bbl. Capacity, 1—8000 Gallon Capacity ½" Plates, 1—Blackmer Pump Complete with 7½ H.P. Motor. C. P. Scanlon, 3109 Pioneer Avenue, Pittsburgh 26, Pennsylvania.

FOR SALE IN STOCK, Quick Delivery: New Welded Steel Tanks and bolted; Used welded and bolted Steel Tanks, for Oil, Water, Gasoline, Grain, etc. Tool Houses, any size, built ready to go. Call or write.

INDEPENDENT TANK CO.
Phone 977, Box 102 Seminole, Okla.

FOR SALE

Two 11" x 5" x 16" Superior 100 H.P. engines. Complete as is, or are completely **rebuilt.**

Three 80 H.P. Clarks direct driven compressors with cylinder sizes to **suit.**

Clark compressor cylinders from 10" x 20" to 26" x 20".

W. S. SMITH
205 Thompson Bldg. Phone 2-5473
Tulsa, Okla.

WE OFFER SUBJECT TO PRIOR SALE THE FOLLOWING NEW PIPE:

Approximately 26,000′ of new 2⅞", O.D., 6.5#, externally upset, Range 2, threaded and coupled, seamless tubing, same as J-55, at 80 cents per foot, f.o.b. Ft. Worth, Texas.

Approximately 65,000′ of new 2⅜", O.D., electric weld, externally upset (about 10 per cent of this pipe is Range 1, the balance is Range 2), at 70 cents per foot, f.o.b., Ft. Worth, Texas.

ROGERS AND WRIGHT, INC.
215 Wright Bldg. Phone 5-3229
Tulsa, Okla.

FOR SALE
ANGLE TYPE GAS ENGINES

1—Cooper Bessemer GMV-800 HP Engine, Less Compressor Cylinders.

3—Cooper Bessemer GMR-300 HP Engines. Each Engine with 3—8¼" x 14" CA Double Acting 75-175 PSI Suction, 500 PSI Working Pressure Compressor Cylinders. Engine capacity 75-500#, 2,700,000 cubic feet per day; 175-500#, 4,750,000 cubic feet per day, equipped with clearance pockets.

All Engines with Water Pumps, Air Filters, Oil Coolers, Mufflers, and Safety Devices.

All in excellent condition.

Location West Virginia. Available for immediate delivery.

Direct inquiries to W. S. MOORE, P. O. Box 873, Charleston, W. Va.

EQUIPMENT FOR SALE

FOR SALE

4" Black Pipe
4½" O.D. x .203 wall
8,000 ft.
Grooved ends for victualic couplings.
75c per ft.

WALLACK BROTHERS
7400 S. Damen Ave., Chicago, Illinois

CAST IRON PIPE

Bell and Spigot

Water Main Pipe

Class 150 and 250

2,100 ft. 4 in.

21,500 ft. 6 in.

9,250 ft. 8 in.

14,250 ft. 10 in.

12,450 ft. 12 in.

12 ft. and 18 ft. lengths

Immediate Delivery, Any Quantity

Write—Wire—Phone

Sonken-Galamba Corp.

2nd and Riverview (X-465)
Kansas City 18, Kansas
THatcher 9243

EQUIPMENT WANTED

WANTED—TOOL JOINTS
Require 100 E.U.I. F. tool joints to replace worn Reed joints on 18# Range 3 full hole 4½" Drill pipe.

MACHINERY DEPOT LIMITED
Calgary, Alberta, Canada

WANTED: 3½" OD or 4½" OD used drill pipe, 3½" OD line pipe or tubing. SCHAFER PLOW, INC. Box 578, Pratt, Kansas. Atten.: J. L. Crowder.

WANTED: Oil field salvage and scrap; abandoned leases, strippers; used tubular products, dead lines. Industrial plant and lease dismantling a specialty, full coverage. HIGHEST PRICES PAID. ROZEN IRON & METAL CO., MAUD, OKLAHOMA. Write P.O. Box 686. Phone 330.

WANTED: Three 100 HP engines and compressors, Superior preferred. Keystone Pipe & Supply Co., 902 Burk Burnett Bldg., Fort Worth, Texas.

WANTED—Failing 55 or 66, or other make of similar capacity, 2⅜", 2⅞" drill pipe or rod. 5 x 8—5 x 10 pump, 2" pipe. Box 1832, Casper, Wyo.

LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908. Oil-Gas (all states), Business, Real Estate, Legal Forms, Leases, Revised With Government Regulations, Commercial Printing, Catalog and Samples on request. Burkhart Printing & Stationery Company, 115 South Cincinnati, Tulsa 3, Oklahoma.

FOR SALE

SMALLEST, Prettiest, Miniature Tri-Cone Rock Bit made. Less than one-half inch diameter. Cones turn. Gold or Nickel plate. On tie chain clasps, strap type for watch fobs and ring type for charms. $5.00 each Money Order or C.O.D. H. McGaughey, P. O. Box 11063, Houston, Texas.

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 418, 815-15th Street, N.W., Washington 5, D. C.

HELP WANTED

CORROSION ENGINEERS

Graduate Engineers, under 30, two or more years' experience in survey and installation work on pipe lines. Sohio Pipe Line Company, P. O. Drawer D-15, St. Louis, Missouri.

WANTED—REFINERY CHEMIST

Must have degree in Chemistry or Chemical Engineering. Give **detailed** information on laboratory experience. Also personal information and salary expected in first letter. Write Box C-869, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEERING

During the next several months we will increase our Engineering Organization engaged in the design of Oil Refinery Plants and Power Plants. Location Cleveland, Ohio. The men we need should be qualified as draftsmen, designers, checkers or in higher engineering skills on design of piping, instrumentation, pressure vessels, structural steel, concrete, mechanical or electrical. For presenting your qualifications and prompt consideration, write to us for application form.

ARTHUR G. McKEE & CO.

2300 Chester Ave., Cleveland 1, Ohio

HELP WANTED

WANTED—PUMP SALES ENGINEER

Must be familiar with the types and makes of Centrifugal and Reciprocating pumps used in the Refining and Process industries and experienced in the selection and application of this type of pumping machinery to meet the requirements of these industries. Position includes selection and application of centrifugal and reciprocating pumps, estimating, handling sales correspondence and sales development work in our Indianapolis Sales Department. Please give detailed description of qualification and experience listing positions held with previous employers. All replies will be kept in strictest confidence.

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TULSA, OKLAHOMA

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Large independent company operating principally on the Texas Gulf Coast. Applicant should have thorough experience in Gulf Coast drilling and production problems, including high pressure reservoir completions of both oil and gas, dual completions, injection wells and should be equipped to prepare and maintain adequate reservoir engineering studies, including utilization of casinghead gas and pressure maintenance. This is a permanent, responsible position and will require a high type of executive. Salary and other remuneration commensurate with background and experience. Man selected will be thoroughly investigated but investigation will be confidential. Reply giving full details as to age, education, training, and salary desired. Our own employees have been advised of this advertisement.

Address Box C-867, The Oil and Gas Journal, Tulsa, Oklahoma.

OUTSTANDING POSITION OPEN

Engineer to direct Sales of Refinery process units. Qualifications to include sales and process engineering experience with major oil companies or petroleum engineering and contracting firms. Knowledge of oil refining process engineering plus economic evaluations and applications necessary. Age 35 to 45 years. Excellent compensation—salary and bonus. Location—New York or Tulsa. When replying state educational and experience background. Our own employees notified of opening.

Address: Box Number C-860, The Oil and Gas Journal, Tulsa, Oklahoma

HELP WANTED

SALES ENGINEERS to sell emulsion treaters, heaters, water knock-outs, etc. Protected territory in Mid-Continent area. Your identity and present position protected. Write qualifications for appointment F. L. Murdock, Murdock Tank & Mfg. Co., P.O. Box 327, Tulsa 7, Oklahoma.

EXPERIENCED and rounded Land Man for large company, preferably with Texas experience. Age limit 45 years. Inquiries will be treated confidentially. Box C-861, The Oil and Gas Journal, Tulsa, Oklahoma.

OLD and established manufacturer of oil well production equipment wants full time representative for Gulf Coast territory, with headquarters in Houston. Salary, traveling expenses and car allowance. Require high class man. State age, experience, whether married or single, give references. Box C-851, The Oil and Gas Journal, Tulsa, Oklahoma.

GRAVITY PARTY CHIEFS: We have several attractive openings in domestic work for experienced and well qualified Party Chiefs. Best opportunities in the industry. Box C-804, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOPHYSICIST with experience in West Texas for interpretation work with major oil company. Permanent location. Box C-856, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

GEOLOGIST - GEOPHYSICIST desires affiliation with progressive independent or small corporation. Wide geophysical, geological, and administrative experience with major oil concern in the Mid-Continent, West Texas, Mississippi, and South Louisiana areas. Capable and qualified in directing and planning an exploration program. Salary plus interest basis preferred or permission to purchase royalties with corporation. Write Box C-865, The Oil and Gas Journal, Tulsa, Oklahoma.

ACCOUNTANT: 15 years experience, including 4 years public accounting, and 6 years crude oil operations and production. Familiar with all phases of accounting pertaining to leasing of acreage, drilling of wells, operating of leases, production and sale of crude oil. Desire to contact oil operator and producer who may be in need of such services. Previous employer sold out and retired. Good references can be furnished. Write: Box C-864, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPERIENCED in Plant Process and Qualified Electronic Service Engineer desires Instrument Work with Refinery or Instrument Organization. Box C-854, The Oil and Gas Journal, Tulsa, Oklahoma.

CRUDE OIL EXECUTIVE

Now With Major Company Desires Make Change. Box C-859, The Oil and Gas Journal, Tulsa, Oklahoma.

REFINERY MANAGER

Excellent record in management and accomplishments. Highest personal, professional, and experience qualifications. Age 44. Available reasonable notice. Box C-862, The Oil and Gas Journal, Tulsa, Oklahoma.

MECHANICAL ENGINEER

15 years experience in Gas Processing and Chemical Industry; including design, development, construction, and operation. Sound engineering background; eight years executive experience. Desire permanent position in progressive organization. Box C-868, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST wants position with ACTIVE independent or individual desiring to enter the oil business. Experienced in development; exploration, including surface and subsurface geology, gravity and seismic interpretation; developing and executing drilling deals; and leasing. Capable of directing exploration campaign and passing on deals submitted. Have worked in most producing states of south and southwest, and have wide acquaintance among oil men and geologists of these areas. Prefer to work on salary-plus-interest basis. Additional information if interested. Write Box C-850, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

PETROLEUM ENGINEER: 1½ years experience Gulf Coast production well completion workovers, General engineering design. Six months with Railroad Commission, Texas graduate, available now. Box C-871, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM Geologist, age 32, doctor's degree, four years geological expert for the Swiss Government, three years geologist with major oil company, one year teaching and reviewing geology, also some experience in geophysics, fluent English, Spanish and French, reading Italian and German, able to go anywhere but prefer South America. Reply P.O. Box Stand 82, Geneva, Switzerland.

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Management executive, who can be of exceptional assistance in one or more fields to a corporation or individual, as an administrator - General Manager - Assistant to President - Sales Manager - Procurement Director. Successful record of twenty-five years in the over-all management field. Salary open. Resume will be sent on request. Address: H. M., P.O. Box 1991, Fort Worth, Texas.

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FOR SALE or will lease for oil: 27,000-acre ranch, very nice, modern improvements, ample water by wells and springs. Carrying capacity 800 to 1,000 cows and calves. The price, $18.00 per acre with ½ minerals. Good terms. Possession now. Write: Guy Speakman, 1326 East Kiowa, Colorado Springs, Colorado.

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Large Scale Oil Developments under way; Oil Leases in and around Wilcox at ground floor prices. Now is time to buy; Address Guy J. Stumpff Co., Wilcox, Ariz.

FOR SALE: Oil and gas leases and drilling propositions in shallow territory Northwest Colorado, Southern Wyoming, and Southeast Utah. Depth of drilling, 400 to 2500 ft. S. Marvin James, Meeker, Colorado. Phone: Meeker 4.

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80,000 acres Government Reservation available for development Northeast Alberta, Canada, on acreage split basis. Geological data very encouraging, profile drilling now proceeding.

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Offer ¼ interest for cable tool well to 600′ on 40A lease. Bonus 40A ½ mile N of well plus ½ interest offset SE 40A lease. Event production cash contract for 3 more wells. Should conditions justify drilling to 1100′ sand ½ interest plus acreage above. We furnish ½ cost of pipe. Location SW Roosevelt County, N. M. Five rotary test wells prove structure along with ample oil shows in updip wells to assure confidence for good shallow production. Details furnished responsible sources. Box C-870, The Oil and Gas Journal, Tulsa, Oklahoma.

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OIL LEASES for sale in large, small or medium size blocks in Colorado, Wyoming, New Mexico, Montana, Arizona. Wholesale or retail. Write for descriptive list. Dyer-OJ, 1835 Champa, Denver, Colorado.

OIL LEASE for Sale: 880 acres, Greenwood County, Kansas. 44 wells, depth 1800 ft. Mississippi lime. Daily net production, 100 bbls. For full particulars contact M. J. Regan, Coffeyville, Kansas.

WILL lease portion 30,000 acre block, reasonable, now being seismographed by major Co. 28 men crew—good U.S.G.S. report. Deep test adjoining block. R. G. Park, 539 Downing, Denver, Colo.

TENNESSEE—88,000 acres timber land—$3.50 per acre, all minerals included. Details: Earl Jester, 12744 Vanowen, North Hollywood, Calif.

WILL give lease on about 200 acres for Fry Sand test. Depth about 1400 feet. Good prospect. W. H. Mahon, P.O. Box 821, Brownwood, Texas.

DRILLING BLOCKS—Bought and sold, Wyoming, Montana, and Utah. Eddie Fisher, Atlantic 0-4914, 2804 South San Gabriel Blvd., San Gabriel, Calif.

GEOLOGIST with extensive knowledge of good oil plays in Wyoming and adjacent states wishes contact with individuals or company willing to go "all out" on an exploratory and wildcat play on a share basis. Cite specifically, who you are, references and financial backing. Write Box C-848, The Oil and Gas Journal, Tulsa, Oklahoma.

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San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

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Recent strikes have focused attention on Montana's deeper oil zones and major companies are moving fast, drilling and leasing. We buy direct in the field, sell direct to our customers. Write LANDOWNERS ROYALTIES COMPANY, Box 1225, Great Falls, Montana.

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RADAR Surveys: Latest mobile radar equipment installed in Jeep and modified for oil exploration. Locates and outlines areas of possible oil saturation. Defines faults. For further information write Geotronic Laboratories, 421 S. Locust St., Centralia, Illinois.

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PIPELINE & POLELINE
SURVEYING — MAPPING

Permian Basin

(Continued from page 160)

dry, TD 10,019 ft., Fusselman 9,180 ft., Simpson 9,310 ft., Ellenburger 9,345 ft. Humble Oil & Refining Co. 1-E Sawyer Cattle Co., SW SE 142-1-T&P, ½ mi. NE Big Lake, dry, TD 10,917 ft., Devonian 9,500 ft., Ellenburger 9,838 ft., elevation 2,765 ft.

TEXAS PANHANDLE (DISTRICT 10) WILDCAT FAILURE

Childress County: Howard M. Baron 1 J. O. Wyatt, 2,300 ft. from N line, 330 ft. from E line, 781-H-W&NW, 1½ mi. NW Carey, dry, TD 2,870 ft.

SOUTHEASTERN NEW MEXICO

HOBBS.—Amerada's 1 J. R. Hamilton, prospective Devonian discovery in NE SW 35-16s-38e, 2 miles southeast of the Garrett one-well field, had total depth at 12,518 ft. in dolomite and prepared to run 5½-in. casing. Drill-stem tests reported were: From 12,455-73 ft., using 2,000 ft. of water blanket and open 4 hours; produced gas in 3½ hours and after pulling 6,660 ft. to drill pipe, the well started unloading oil. Recovery was 3,450 ft. of oil and 1,980 ft. of oil and gas-cut water blanket.

A 7-hour and 45-minute test from 12,488-12,518 ft., with 2,500 ft. of water blanket, brought gas to the surface in 2 hours and 30 minutes. Time of the oil flow was not reported. For the first 10 minutes it cleaned into pits, then gaged 9 bbl. of mud and water in 30 minutes. Following hourly gages were: 18.6 bbl. of fluid, 15 per cent sediment and 25 per cent water; 15.8 bbl. fluid, 16 per cent water; 17.9 bbl. of fluid slightly cut with sediment and water; the same flow and cut the fourth hour; and the last 30 minutes gaged 8.28 bbl. of oil, for a total of 87.6 bbl. of fluid. Oil tested 46.9°-gravity. Gas-oil ratio was around 215 cu. ft.

Magnolia Petroleum Co. 1 Betenbaugh, SW SW 12-9s-35e, 5½ miles northwest of the Crossroads field, was reported running some 200 ft. high to the Crossroads discovery, on top of the Pennsylvanian at 8,850 ft. A 3-hour and 45-minute drill-stem test from 8,801-8,981 ft. recovered the 1,000-ft. water blanket plus 75 ft. of drilling mud with no shows. It continued drilling below 8,995 ft.

SOUTHEAST NEW MEXICO WILDCAT FAILURE

Lea County: Phillips Petroleum Co. 1 McCormick, SW SW 18-25s-35e, dry, TD 7,020 ft., anhydrite 910 ft., salt 1,065 ft., Delaware lime 5,463 ft., sand 5,495 ft., elevation 3,367 ft.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D. C. Notice is hereby given that the lands listed herein are offered through sealed bids on the terms hereinafter specified, to qualified bidders of the highest cash amounts per acre as a bonus for the privilege of leasing the lands under sec. 17 of the Leasing Act of February 25, 1920 (41 Stat. 437; 30 U.S.C. sec. 181) as amended. All bids must be submitted to the Director, Bureau of Land Management, Washington 25, D. C., on or before 1 p.m. of the date set out herein. Each bidder must submit with the bid one-fifth of the amount bid in cash or by certified check on a solvent bank or by money order made payable to the order of the Treasurer of the United States, and file the showing of qualifications to receive a lease required under 43 CFR 192.42 (b) and (c). The envelopes should be plainly marked that they are not to be opened before the date and hour set out herein, and should show the number of the parcel and the name of the field. No bids received after the hour fixed herein for receiving bids will be considered. The remainder of the bonus and the annual rental must be paid and an acceptable surety bond in the sum of at least double the amount of rental, but in no case less than $1,000 nor more than $5,000, must be furnished by a successful bidder prior to the issuance of a lease. An acceptable $5,000 surety bond will be required prior to commencing drilling operations on the land. The deposits of the other bidders will be returned upon acceptance of the successful bids. Bidders are warned against violation of section 59, U.S. Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids. Royalties payable to the United States will be at the rate of 12½ per cent to 25 per cent for oil, and 12½ per cent to 16⅔ per cent for gas, in accordance with Schedule B in the lease form. Annual rental will be at the rate of $1.00 per acre. The lands are in the known geologic structure of the Greybull Oil and Gas Field, Wyoming, and are offered in the following parcels, all in T. 52 N., R. 93 W., 6th P.M.: Parcel No. 1 Sec. 16, lots 1 and 6, 16.27 acres. Parcel No. 2 Sec. 17, lots 7 and 8, 4.18 acres. Total acreage 20.45 acres. Bids must be sumbitted on or before 1 P.M. May 4, 1949, and must be submitted to each parcel separately, but no objection will be made to the award of both parcels to the same successful bidder. Marion Clawson, Director.

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CALENDAR

April

Mid-Continent Oil and Gas Association, annual federal tax forum, Roosevelt Hotel, New Orleans, April 18-19.

Midwest Power Conference, annual meeting, Hotel Sherman, Chicago, April 18-20.

Natural Gasoline Association of America, annual meeting, Texas Hotel, Fort Worth, April 20-22.

Southern Gas Association, annual convention, Buena Vista Hotel, Biloxi, Miss., April 20-22.

American Geophysical Union, annual meeting, National Museum, Washington, April 20-22.

American Geophysical Union, regional meeting, Denver, April 26-27.

Petroleum Industry Electrical Association, Petroleum Electrical Supply Association, annual convention, Mayo Hotel, Tulsa, April 26-28.

American Petroleum Institute, eastern district, William Penn Hotel, Pittsburgh, Pa., April 27-29.

Society of Automotive Engineers, Engineering Societies Building, New York, April 28.

May

American Society of Mechanical Engineers, spring meeting, Mohican Hotel, New London, Conn., May 2-4.

Independent Petroleum Association of America, midyear meeting, Roosevelt Hotel, New Orleans, La., May 2-3.

American Petroleum Institute, division of marketing, midyear meeting, Jefferson Hotel, St. Louis, May 9-10.

American Gas Association, natural-gas department, spring meeting, French Lick Springs Hotel, French Lick, Ind., May 9-10.

Interstate Oil Compact Commission, spring quarterly meeting, Roosevelt Hotel, Jacksonville, Fla., May 9-11.

American Institute of Chemical Engineers, regional meeting, Mayo Hotel, Tulsa, May 9-11.

Liquefied-Petroleum Gas Association, annual convention, Palmer House, Chicago, May 9-11.

American Petroleum Institute, division of production, Pacific Coast district meeting, Biltmore Hotel, Los Angeles, Calif., May 12-13.

Instrument Society of America, annual spring meeting, Royal York Hotel, Toronto, Canada, May 12-13.

Oil-Heat Institute of America, national oil-heat exposition and annual convention, Boston, Mass., May 16-20.

American Gas Association, production and chemical conference, Hotel New Yorker, New York, May 23-25.

American Association of Oilwell Drilling Contractors' fourth annual drilling industry safety clinic, May 24-25, Baker Hotel, Dallas.

Society of Automotive Engineers, diesel engines, Engineering Societies Building, New York, May 26.

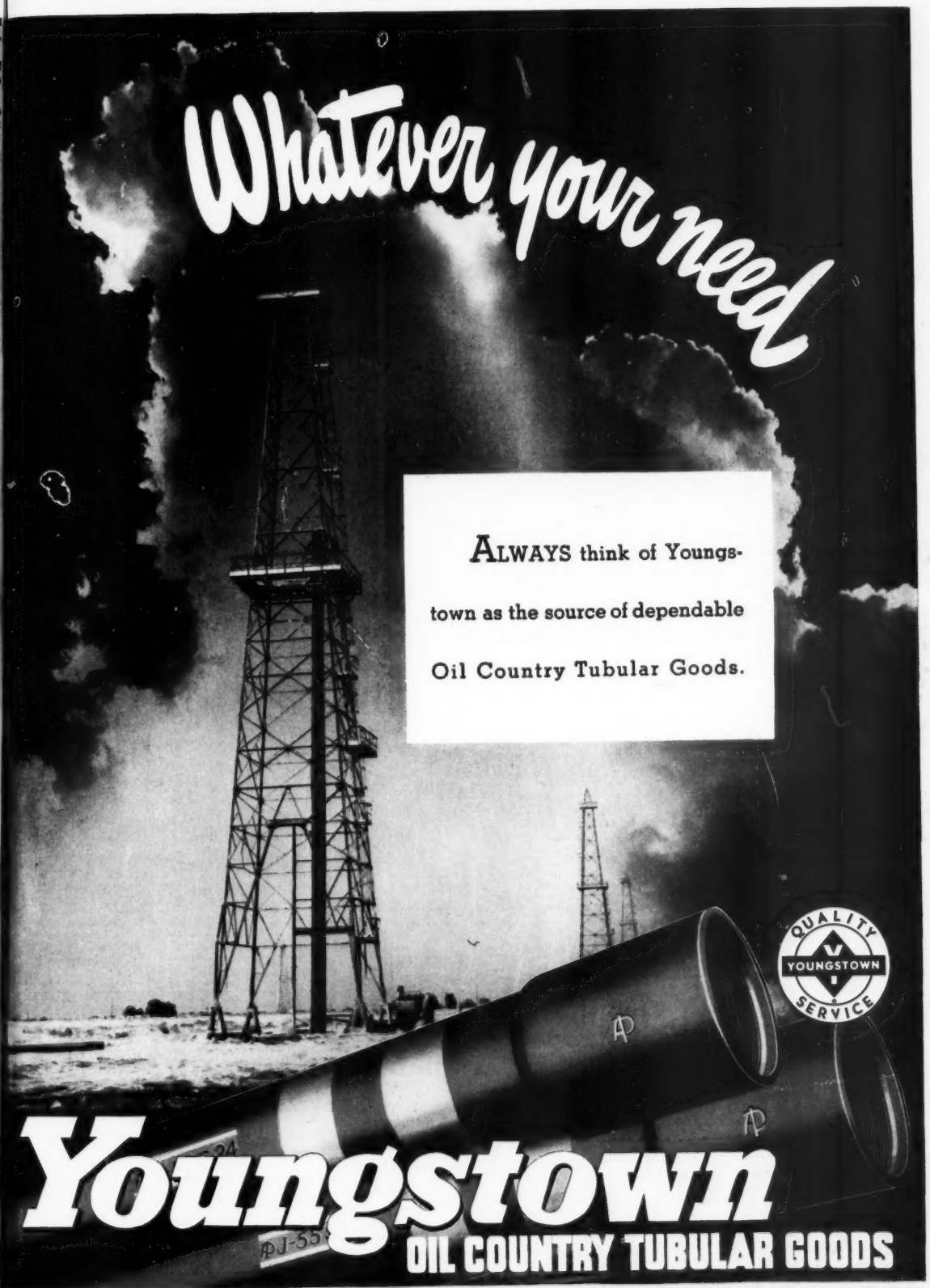
American Petroleum Institute, Rocky Mountain district, Gladstone Hotel, Casper, Wyo., May 26-27.

Natural Gas and Petroleum Association of Canada, annual meeting, Hotel London, London, Ont., Canada, May 26-27.

Fourth Annual Short Course in Gas Technology, sponsored by Southern Gas Association, Texas A. & I. College, Kingsville, May 30-June 1.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D. C. Notice is hereby given that the lands listed herein are offered through sealed bids on the terms hereinafter specified, to qualified bidders of the highest cash amounts per acre as a bonus for the privilege of leasing the lands under sec. 17 of the Leasing Act of February 25, 1920 (41 Stat. 437; 30 U.S.C. sec. 181), as amended. All bids must be submitted to the Director, Bureau of Land Management, Washington 25, D. C., on or before 1 p.m. of the date set out herein. Each bidder must submit with the bid one-fifth of the amount bid in cash or by certified check on a solvent bank or by money order made payable to the order of the Treasurer of the United States, and file the showing of qualifications to receive a lease required under 43 CFR 192.42 (b) and (c). The envelopes should be plainly marked that they are not to be opened before the date and hour set out herein, and should show the number of the parcel and the name of the field. No bids received after the hour fixed herein for receiving bids will be considered. The remainder of the bonus and the annual rental must be paid and an acceptable surety bond in the sum of at least double the amount of rental, but in no case less than $1,000 nor more than $5,000, must be furnished by a successful bidder prior to the issuance of a lease. An acceptable $5,000 surety bond will be required prior to commencing drilling operations on the land. The deposits of the other bidders will be returned upon acceptance of the successful bids. Bidders are warned against violation of section 59, U. S. Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids. Royalties payable to the United States will be at the rate of 12½ per cent to 25 per cent for oil, and 12½ per cent to 16⅔ per cent for gas, in accordance with Schedule B in the lease form. Annual rental will be at the rate of $1.00 per acre. The land is offered in one parcel described as the S½SW¼ sec. 34, T. 27 N., R. 90 W., 6th P.M., Wyoming, 80 acres, and is within the known geologic structure of the Lost Soldier field. Bids must be submitted on or before 1 p.m. April 27, 1949. Marion Clawson, Director.



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